LABORATORY DATA CONSULTANTS, INC.

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Posillico Consulting
1750 New Highway
Farmingdale, NY 11735
ATTN: Mr. Ellis Koch

May 8, 2014

SUBJECT: Glen Isle, Data Validation

Dear Mr. Koch,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on April 21, 2014. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #31685:

SDG #	Fraction
160-5231-1, 160-5365-1 160-5405-1, 160-5405-2 160-5481-1, 160-5485-1	Gamma Spectroscopy, Alpha Spectroscopy, Radium-226, Radium-228

The data validation was performed under category A and B guidelines. The analyses were validated using the following documents, as applicable to each method:

- Multi Agency Radiological Laboratory Analytical Protocols Manual, July 2004
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011, January 2010

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
Project Manager/Chemist

5,336 pages-DL

Attachment 1

Cat A/CatB EDD

LDC #31685 (Posillico Consulting - Farmingdale, NY / Glen Isle)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Gamma Spec. (GA-01-R)		Alpha Spec. (A-01-R)		Ra-226 (903.0)		Ra-228 (904.0)																									
Matrix:	Water/Soil			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	160-5231-1	04/21/14	05/12/14	2	2	2	2	2	0	2	0																								
A	160-5231-1	04/21/14	05/12/14	0	1	0	1	-	-	-	-																								
B	160-5365-1	04/21/14	05/12/14	1	1	1	1	1	0	1	0																								
B	160-5365-1	04/21/14	05/12/14	0	1	0	1	-	-	-	-																								
C	160-5405-1	04/21/14	05/12/14	3	1	3	1	3	0	3	0																								
C	160-5405-1	04/21/14	05/12/14	2	1	2	1	2	0	2	0																								
D	160-5405-2	04/21/14	05/12/14	-	-	-	-	1	0	-	-																								
D	160-5405-2	04/21/14	05/12/14	-	-	-	-	1	0	-	-																								
E	160-5481-1	04/21/14	05/12/14	0	1	0	1	-	-	-	-																								
F	160-5485-1	04/21/14	05/12/14	0	2	0	2	-	-	-	-																								
F	160-5485-1	04/21/14	05/12/14	0	1	0	1	-	-	-	-																								
Total	T/CR			8	11	8	11	10	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56

Shaded cells indicate Cat B review (all other cells are Cat A review). These sample counts do not include MS/MSD, and DUPs

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5231-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR Glen Isle Partners, LLC
Date: April 30, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
FB004	160-5231-1	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
LT-X-002-6-8**	160-5231-2	Gamma Spectroscopy**, Alpha Spectroscopy**
LT-C-013-6-8	160-5231-3	Gamma Spectroscopy, Alpha Spectroscopy
FB003	160-5231-4	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
LT-C-016-8-10	160-5231-5	Gamma Spectroscopy, Alpha Spectroscopy
FB004DUP	160-5231-1DUP	Gamma Spectroscopy, Alpha Spectroscopy
LT-X-002-6-8DUP	160-5231-2DUP	Gamma Spectroscopy, Alpha Spectroscopy

Associated QC Samples(s):
Field Blanks: FB004, FB003
Field Duplicate pair: None Associated

The above-listed water and soil samples were collected from January 15, 2014 through January 16, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Actinium-228	0.01276 pCi/g	<RL	LT-X-002-6-8**
	Radium-226	0.01602 pCi/g	<RL	LT-C-013-6-8
	Radium-228	0.01276 pCi/g	<RL	LT-C-016-8-10

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Isotope	Reported Level	Validation Action
LT-X-002-6-8**	Radium-226 Radium-228	0.972 pCi/g 0.490 pCi/g	1.00U pCi/g 1.00U pCi/g
LT-C-013-6-8	Radium-228	0.711 pCi/g	1.00U pCi/g
LT-C-016-8-10	Radium-228	0.648 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

Samples FB004 and FB003 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Thorium-230	0.06449 pCi/g	<RL	LT-X-002-6-8** LT-C-013-6-8 LT-C-016-8-10

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Isotope	Reported Level	Validation Action
LT-X-002-6-8**	Thorium-230	0.671 pCi/g	1.00U pCi/g
LT-C-013-6-8	Thorium-230	0.754 pCi/g	1.00U pCi/g
LT-C-016-8-10	Thorium-230	0.540 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

Samples FB004 and FB003 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

Samples FB004 and FB003 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

Samples FB004 and FB003 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on samples LT-X-002-6-8** and FB004 for gamma spectroscopy and alpha spectroscopy. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31685A35 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5231-1 Cat A/Cat B Page: 1 of 1
Laboratory : Test America, Inc. Reviewer: MG
2nd Reviewer: [signature]

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-15-14 through 1-16-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks	ND	FB= 1, 4

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	FB004	W	11		21		31		
2	LT-X-002-6-8**	S	12		22		32		
3	LT-C-013-6-8	↓	13		23		33		
4	FB003	W	14		24		34		
5	LT-C-016-8-10	S	15		25		35		
6	FB004DUP	W	16		26		36		
7	LT-X-002-6-8DUP	S	17		27		37		
8			18		28		38		
9			19		29	PBW	39		
10			20		30	PBS	40		

Notes: _____

LDC #: 31685A35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. (Soil) / Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) $\leq$1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

LDC #: 31685A35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685A35

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: 02

METHOD: Radiochemistry, Method GA-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/g **Associated Samples:** all soil

Isotope	Blank ID	Blank Action Limit	Sample Identification										
[redacted]	PB		2	3	5								
Ac-228	0.01276												
Ra-226	0.1602		0.972/1.00U										
Ra-228	0.01276		0.490/1.00U	0.711/1.00U	0.648/1.00U								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31685A35
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: CZ

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Am-241	96.50 (pCi/g)	101 (pCi/g)	96	96	Y
—	Matrix spike sample	—	—	—	—	—	—
7	Duplicate RPD	Tl-208	0.162 ± 0.0191 (pCi/g)	0.1526 ± 0.0178 (pCi/g)	RER 0.25	RER 0.25	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685A35
SDG #: ~

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: CR

METHOD: Radiochemistry (Method: GA-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #2, Pb-214 reported with a positive detect were recalculated and verified using the following equation:

Activity =

$$\frac{(\text{cpm} - \text{bckgrd cpm})}{(2.22)(E)(\text{Vol})(CF)}$$

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

Recalculation:

$$\frac{(14.71\ \text{dps})(27.03\ \text{pCi/dps})}{892.2\ \text{g}} = 0.4457\ \text{pCi/g}$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	2	Pb-214	0.446	0.446	Y

Note:

LDC #: 31685A36
SDG #: 160-5231-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
Cat A/Cat B

Date: 4-29-14
Page: 1 of 1
Reviewer: MG
2nd Reviewer: OR

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-15-14 through 1-16-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks < RL	ND	FB= 1, 4

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	1	FB004	W	11		21		31	
2		LT-X-002-6-8 **	S	12		22		32	
3		LT-C-013-6-8	↓	13		23		33	
4	1	FB003	W	14		24		34	
5		LT-C-016-8-10	S	15		25		35	
6	1	FB004DUP	W	16		26		36	
7		LT-X-002-6-8DUP	S	17		27		37	
8				18		28		38	
9				19		29	1 PBW	39	
10				20		30	2 PBS	40	

Notes:

LDC #: 31685A36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. (Soil) / (Water).		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) $\leq$1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685A36

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Radiochemistry, Method A-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/g **Associated Samples: all soil**

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		2	3	5								
Th-230	0.06449		0.671/1.00U	0.754/1.00U	0.540/1.00U								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31685A36
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found / True x 100 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Th-230	24.10 (pCi/g)	24.5 (pCi/g)	98	98	Y
—	Matrix spike sample	—	—	—	—	—	—
7	Duplicate RPD	U-238	0.544 ± 0.166 (pCi/g)	0.577 ± 0.168 (pCi/g)	RER 0.10	RER 0.10	Y
2	Chemical recovery	Th-229	11.412 (dpm)	13.59 (dpm)	84.0	84.0	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685A36
SDG #: ~

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer:

METHOD: Radiochemistry (Method: A-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for # 2, Th-232 reported with a positive detect were recalculated and verified using the following equation:

Activity = (cpm - bckgrd cpm) / (2.22)(E)(Vol)(CF)

Recalculation:

$$\frac{(66/180) - (0.1875/180)}{(2.22)(0.2789)(1.0026g)(0.8399)(1.002)} = 0.6998 \text{ pCi/g}$$

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	2	Th-232	0.700	0.700	Y
		U-233/234	0.612	0.614	↓

Note:

LDC #: 31685A29a
SDG #: 160-5231-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/~~Cat B~~

Date: 4-29-14
Page: 1 of 1
Reviewer: MG
2nd Reviewer: CR

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-15-14 through 1-16-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII	Field blanks	ND	FB = 1, 2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.
all water

1	FB004	11		21		31	
2	FB003	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31685A29b **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5231-1 Cat A/~~Cat B~~ Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-15-14 through 1-16-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII	Field blanks	ND	FB = 1, 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.
all water

1	FB004	11		21		31	
2	FB003	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5365-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR Glen Isle Partners, LLC
Date: May 8, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-G-029-2-4**	160-5365-1	Gamma Spectroscopy**, Alpha Spectroscopy**
FB011	160-5365-2	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
DUP008	160-5365-3	Gamma Spectroscopy, Alpha Spectroscopy
FB011DUP	160-5365-2DUP	Gamma Spectroscopy
DUP008DUP	160-5365-3DUP	Gamma Spectroscopy

Associated QC Samples(s):
Field Blanks: FB011
Field Duplicate pair: LT-G-029-2-4** and DUP008

The above-listed water and soil samples were collected on January 28, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Uranium-235	0.01620 pCi/g	<RL	LT-G-029-2-4** DUP008

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Isotope	Reported Level	Validation Action
LT-G-029-2-4**	Uranium-235	0.0953 pCi/g	1.00U pCi/g
DUP008	Uranium-235	0.0803 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

FB011 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Thorium-230	0.01357 pCi/L	<RL	FB011
PB (prep blank)	Uranium-233/234	0.06962 pCi/g	<RL	LT-G-029-2-4**
	Uranium-238	0.06071 pCi/g	<RL	DUP008

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Isotope	Reported Level	Validation Action
FB011	Thorium-230	0.135 pCi/g	1.00U pCi/g
LT-G-029-2-4**	Uranium-233/234	0.561 pCi/g	1.00U pCi/g
	Uranium-238	0.516 pCi/g	1.00U pCi/g
DUP008	Uranium-233/234	0.710 pCi/g	1.00U pCi/g
	Uranium-238	0.735 pCi/g	1.00U pCi/g

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

FB011 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

FB011 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

FB011 was identified as a field blank. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on samples FB011 and DUP008 for gamma spectroscopy. All criteria were met.

Field Duplicate Results

Isotopes were detected in the field duplicate samples. The following table summarizes the concentrations and validation actions taken.

Gamma Spectroscopy

Isotope	Activity (pCi/g)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-G-029-2-4**	DUP008			
Actinium-228	1.18	0.852	32 (≤100)	-	-
Bismuth-212	1.17	0.971	19 (≤100)	-	-
Bismuth-214	0.832	0.644	25 (≤100)	-	-
Lead-210	0.891	0.743	18 (≤100)	-	-
Lead-212	1.26	0.934	30 (≤100)	-	-
Lead-214	.930	0.696	29 (≤100)	-	-
Potassium-40	20.4	14.8	32 (≤100)	-	-
Radium-226	2.44	1.65	-	0.79 (≤2.00)	-
Radium-228	1.18	0.852	-	0.328 (≤2.00)	-
Thorium-234	1.06	0.805	-	0.255 (≤2.00)	-
Thallium-208	0.393	0.315	-	0.078 (≤0.200)	-
Uranium-235	0.0953	0.0803	-	0.015 (≤2.00)	-
Uranium-238	1.06	0.805	-	0.255 (≤2.00)	-
Protactinium-234m	2.58	2.26	-	0.32 (≤20.0)	-

-=no action required

For soil results > 5xRL and RPDs >100; estimate (J) results in the field duplicate pair.
For soil results < 5xRL; the sample and duplicate results must be within 2XRL.

Alpha Spectroscopy

Isotope	Activity (pCi/g)		RPD (Limits)	Difference (Limits)	Validation Actions
	LT-G-029-2-4**	DUP008			
Thorium-228	0.844	0.767	-	0.077 (≤2.00)	-
Thorium-230	0.882	0.527	-	0.355 (≤2.00)	-
Thorium-232	0.852	0.428	-	0.424 (≤2.00)	-
Uranium-233/234	0.561	0.710	-	0.149 (≤2.00)	-
Uranium-238	0.516	0.735	-	0.219 (≤2.00)	-

-=no action required

For soil results > 5xRL and RPDs >100; estimate (J) results in the field duplicate pair.
For soil results < 5xRL; the sample and duplicate results must be within 2XRL.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31685B35 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5365-1 Cat A/Cat B Page: 1 of 1
Laboratory : Test America, Inc. Reviewer: MG
2nd Reviewer: OL

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-28-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	SW	D = 1+3
XI	Field blanks	ND	FB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-G-029-2-4 ** S		11			21		31	
2 2	FB011 W		12			22		32	
3	DUP008 S		13			23		33	
4 2	FB011DUP W		14			24		34	
5	DUP008DUP S		15			25		35	
6			16			26		36	
7			17			27		37	
8			18			28		38	
9			19			29 1	PBS	39	
10			20			30 2	PBW	40	

Notes: _____

LDC #: 31685B35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil) / (Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) $\leq$1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685B35

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer:

METHOD: Radiochemistry, Method Ga-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/g **Associated Samples:** all soil

Isotope	Blank ID	Blank Action Limit	Sample Identification									
	PB		1	3								
U-235	0.01620		0.0953/1.00U	0.0803/1.00U								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC#: 31685B35

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: MG
2nd Reviewer: AV

METHOD: Radiochemistry (Method: GA-01-R)

Isotope	Activity (pCi/g) 1	Activity (pCi/g) 3	(≤100) RPD	Difference	Limits	Qualify Parent Only
Ac-228	1.18	0.852	32			
Bi-212	1.17	0.971	19			
Bi-214	0.832	0.644	25			
Pb-210	0.891	0.743	18			
Pb-212	1.26	0.934	30			
Pb-214	0.930	0.696	29			
K-40	20.4	14.8	32			
Ra-226	2.44	1.65		0.79	(≤2.00)	
Ra-228	1.18	0.852		0.328	(≤2.00)	
Th-234	1.06	0.805		0.255	(≤2.00)	
Tl-208	0.393	0.315		0.078	(≤0.200)	
U-235	0.0953	0.0803		0.015	(≤2.00)	
U-238	1.06	0.805		0.255	(≤2.00)	
Pa-234m	2.58	2.26		0.32	(≤20.0)	

V:\FIELD DUPLICATES\FD_inorganic\31685B35.wpd

LDC #: 31685B35
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: 9

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found / True x 100 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cs-137	35.62 (pCi/g)	35.8 (pCi/g)	99	99	Y
—	Matrix spike sample	—	—	—	—	—	—
5	Duplicate RPD	Ra-228	0.852 (pCi/g) ± 0.0956	0.9402 (pCi/g) ± 0.106	0.44	0.44	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685B35
SDG #: —

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: JL

METHOD: Radiochemistry (Method: GA-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?

(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, Ra-226 reported with a positive detect were recalculated and verified using the following equation:

Activity =

$$\frac{(\text{cpm} - \text{bckgrd cpm})}{(2.22)(E)(\text{Vol})(CF)}$$

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

Recalculation:

$$\frac{(45.66\ \text{dps})(27.03\ \text{pCi/dps})}{506.8\ \text{g}} = 2.4353\ \text{pCi/g}$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	Ra-226	2.44	2.44	Y

Note:

LDC #: 31685B36 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5365-1 Cat A/Cat B Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-28-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	SW	D = 1+3
XII.	Field blanks < RL	ND	FB = 2

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	LT-G-029-2-4**	S	11		21		31	
2 2	FB011	W	12		22		32	
3	DUP008	S	13		23		33	
4			14		24		34	
5			15		25		35	
6			16		26		36	
7			17		27		37	
8			18		28		38	
9			19		29 1	PBS	39	
10			20		30 2	PBW	40	

Notes:

LDC #: 31685B36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil / Water).		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error rations (DER) $\leq$1.42?.			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

LDC #: 31685B36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685B36

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Radiochemistry, Method A-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/L **Associated Samples: all water**

Isotope	Blank ID	Blank Action Limit	Sample Identification										
[illegible]	PB		2										
Th-230	0.1357		0.135/1.00U										

Conc. units: pCi/g **Associated Samples: all soil**

Isotope	Blank ID	Blank Action Limit	Sample Identification										
[illegible]	PB		1	3									
U-233/234	0.06962		0.561/1.00U	0.710/1.00U									
U-238	0.06071		0.516/1.00U	0.735/1.00U									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC#: 31685B36

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: MG
2nd Reviewer: AL

METHOD: Radiochemistry (Method: A-01-R)

Isotope	Activity (pCi/g) 1	Activity (pCi/g) 3	(≤100) RPD	Difference	Limits	Qualify Parent Only
Th-228	0.844	0.767		0.077	(≤2.00)	
Th-230	0.882	0.527		0.355	(≤2.00)	
Th-232	0.852	0.428		0.424	(≤2.00)	
U-233/234	0.561	0.710		0.149	(≤2.00)	
U-238	0.516	0.735		0.219	(≤2.00)	

V:\FIELD DUPLICATES\FD_inorganic\31685B36.wpd

LDC #: 31685B36
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: 9

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	U-233/234	6.448 (pCi/g)	6.37 (pCi/g)	101	101	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
1	Chemical recovery	U-232	13.303 (dpm)	16.45 (dpm)	80.9	82.9	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685B36
SDG #: —

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: CR

METHOD: Radiochemistry (Method: A-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, U-238 reported with a positive detect were recalculated and verified using the following equation:

Activity = (cpm - bckgrd cpm) / (2.22)(E)(Vol)(CF)

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

Recalculation:

$$\frac{(47/180) - (0.5625/180)}{(2.22)(0.2716)(1.0010\,g)(0.8285)} = 0.5159 \text{ pCi/g}$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	Th-230	0.882	0.883	Y
		U-238	0.516	0.516	↓

Note:

LDC #: 31685B29a **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5365-1 Cat ~~A/Cat B~~ Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: R

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-28-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks < RL	ND	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

water

1	FB011	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31685B29b **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5365-1 Cat A/~~Cat B~~ Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: AL

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-28-14
II.	Initial calibration	N	Not reviewed for Cat A review.
III.	Calibration verification	N	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	N	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII	Field blanks	ND	FB = 1

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Water

1	FB011	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5405-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR Glen Isle Partners, LLC
Date: May 1, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-R-001-0-5**	160-5405-1	Gamma Spectroscopy**, Alpha Spectroscopy**
LT-R-001-5-10	160-5405-2	Gamma Spectroscopy, Alpha Spectroscopy
LT-R-001-GW	160-5405-3	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
LT-R-002-GW**	160-5405-4	Gamma Spectroscopy**, Alpha Spectroscopy**, Ra-226**, Ra-228**
FB014	160-5405-5	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
FB015	160-5405-6	Gamma Spectroscopy, Alpha Spectroscopy, Ra-226, Ra-228
LT-R-003-GW**	160-5405-7	Gamma Spectroscopy**, Alpha Spectroscopy**, Ra-226**, Ra-228**
LT-R-001-0-5DUP	160-5405-1DUP	Gamma Spectroscopy, Alpha Spectroscopy
LT-R-001-GWDUP	160-5405-3DUP	Gamma Spectroscopy, Alpha Spectroscopy, Ra-228
FB014DUP	160-5405-5DUP	Ra-226

Associated QC Samples(s):
Field Blanks: FB014, FB015
Field Duplicate pair: None Associated

The above-listed water and soil samples were collected on January 31, 2014 and were analyzed for gamma spectroscopy by method GA-01-R, alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R, Radium-226 by EPA Method 903.0, and Radium-228 by EPA Method 904.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Lead-214	0.01915 pCi/g	<RL	LT-R-001-0-5** LT-R-001-5-10

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

No samples were qualified since the associated sample results were nondetect.

Samples FB014 and FB015 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Thorium-230	0.1357 pCi/L	<RL	LT-R-001-GW LT-R-002-GW** FB014 FB015 LT-R-003-GW**
PB (prep blank)	Uranium-233/234 Uranium-238	0.06962 pCi/g 0.06071 pCi/g	<RL <RL	LT-R-001-0-5** LT-R-001-5-10

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample	Isotope	Reported Level	Validation Action
LT-R-001-0-5**	Uranium-233/234 Uranium-238	0.586 pCi/g 0.467 pCi/g	1.00U pCi/g 1.00U pCi/g
LT-R-001-5-10	Uranium-233/234 Uranium-238	0.590 pCi/g 0.684 pCi/g	1.00U pCi/g 1.00U pCi/g
LT-R-001-GW	Thorium-230	0.117 pCi/L	1.00U pCi/L
FB014	Thorium-230	0.173 pCi/L	1.00U pCi/L
FB015	Thorium-230	0.175 pCi/L	1.00U pCi/L

These results can be used for project objectives as nondetect (U) which may have a minor impact on the data usability.

Samples FB014 and FB015 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Radium-226

No isotopes were detected above the minimum detectable activity (MDA).

Samples FB014 and FB015 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Radium-228

No isotopes were detected above the minimum detectable activity (MDA).

Samples FB014 and FB015 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on samples LT-R-001-0-5** for gamma spectroscopy and alpha spectroscopy, LT-R-001-GW for gamma spectroscopy, alpha spectroscopy, radium-228, and FB014 for radium-266. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31685C35 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5405-1 Cat A/Cat B Page: 1 of 1
Laboratory : Test America, Inc. Reviewer: MG
2nd Reviewer: [signature]

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-31-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks < RL	ND	FB = 5, 6

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1	1	LT-R-001-0-5 **	S	11		21		31	
2	1	LT-R-001-5-10	↓	12		22		32	
3		LT-R-001-GW	W	13		23		33	
4		LT-R-002-GW **		14		24		34	
5		FB014		15		25		35	
6		FB015		16		26		36	
7		LT-R-003-GW **		17		27		37	
8	1	LT-R-001-0-5DUP	S	18		28		38	
9		LT-R-001-GWDUP	W	19		29	1 PBS	39	
10				20		30	2 PBW	40	

Notes: _____

LDC #: 31685C35
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. (Soil) / (Water).		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anayized at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) $\leq$1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685C35

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: 9

METHOD: Radiochemistry, Method GA-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/g **Associated Samples:** all soil (>RL)

Isotope	Blank ID	Blank Action Limit	Sample Identification										
[redacted]	PB		No Qual's.										
Pb-214	0.01915												

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31685C35
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Co-60	56240 (pCi/L)	59200 (pCi/L)	95	95	Y
—	Matrix spike sample	—	—	—	—	—	—
9	Duplicate RPD	Pb-214	56.1 (pCi/L) ± 9.63	45.59 (pCi/L) ± 10.2	RER 0.53	RER 0.53	Y
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685C35
SDG #: ~

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: [illegible]

METHOD: Radiochemistry (Method: GA-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?

(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #4, Ac-228 reported with a positive detect were recalculated and verified using the following equation:

Activity = (cpm - bckgrd cpm) / (2.22)(E)(Vol)(CF)

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

Recalculation:

$$\frac{(1.006\ dps)(27.03\ pCi/dps)}{1,000\ L} = 27.192\ pCi/L$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	Bi-214	0.716	0.716	Y
			(pCi/L)	(pCi/L)	
2	4	Ac-228	27.2	27.2	
3	7	Pb-214	71.2	71.2	

Note:

LDC #: 31685C36 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-29-14
SDG #: 160-5405-1 Cat A/Cat B Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: OL

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-31-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks < RL	ND	FB = 5, 6

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

1 1	LT-R-001-0-5 **	S	11		21		31		
2 1	LT-R-001-5-10	↓	12		22		32		
3	LT-R-001-GW	W	13		23		33		
4	LT-R-002-GW **	↓	14		24		34		
5	FB014		15		25		35		
6	FB015		16		26		36		
7	LT-R-003-GW **	↓	17		27		37		
8 1	LT-R-001-0-5DUP	S	18		28		38		
9	LT-R-001-GWDUP	W	19		29 1	PBS	39		
10			20		30 2	PBW	40		

Notes: _____

LDC #: 31685C36
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: CL

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. (Soil) (Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) $\leq$1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685C36

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: CR

METHOD: Radiochemistry, Method See Cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: pCi/L **Associated Samples: all water**

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		3	5	6								
Th-230	0.1357		0.117/1.00U	0.173/1.00U	0.175/1.00U								

Conc. units: pCi/g **Associated Samples: all soil**

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		1	2									
U-233/234	0.06962		0.586/1.00U	0.590/1.00U									
U-238	0.06071		0.467/1.00U	0.684/1.00U									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31685C36

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: CL

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	U-238	12.66 (pCi/L)	13.0 (pCi/L)	97	97	Y
–	Matrix spike sample	–	–	–	–	–	–
9	Duplicate RPD	Th-230	0.117 (pCi/L) ± 0.0774	0.2124 (pCi/L) ± 0.107	RER 0.52	RER 0.52	Y
4	Chemical recovery	Th-229	8.468 (dpm)	13.59 (dpm)	62.3	62.3	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685C36
SDG #: —

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: CR

METHOD: Radiochemistry (Method: A-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #4, U-233/234 reported with a positive detect were recalculated and verified using the following equation:

Activity = (cpm - bckgrd cpm) / (2.22)(E)(Vol)(CF)

Recalculation:

$$\frac{(34/240)-(1.250/240)}{(2.22)(0.2727)(0.100\ L)(0.6702)(0.998)} = 3.370\ pCi/L$$

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	Th-232	0.442	0.442	Y
			(pCi/L)	(pCi/L)	
2	4	U-233/234	3.37	3.37	
3	7	Th-228	2.57	2.57	

Note:

LDC #: 31685C29a
SDG #: 160-5405-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
Cat A/Cat B

Date: 4-29-14
Page: 1 of 1
Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-31-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII	Field blanks	ND	FB = 3, 4

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.
all water

1	LT-R-001-GW	11		21		31	
2	LT-R-002-GW **	12		22		32	
3	FB014	13		23		33	
4	FB015	14		24		34	
5	LT-R-003-GW **	15		25		35	
6	FB014DUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31685C29a
SDG #: —

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: CR

Method: Radiochemistry (EPA Method 903.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / (Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anayized at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error ratios (DER) $\leq$1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685C29a
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: 02

METHOD: Radiochemistry (Method: 903.0)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ra-226	12.54 (pCi/L)	11.2 (pCi/L)	112	112	Y
—	Matrix spike sample	—	—	—	—	—	—
6	Duplicate RPD	Ra-226	0.0875 U (pCi/L) ± 0.0966	0.1224 U (pCi/L) ± 0.101	RER 0.18	RER 0.18	Y
2	Chemical recovery	Ba	0.0236 (g)	0.0339 (g)	69.6	69.6	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685C29a
SDG #: —

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer:

METHOD: Radiochemistry (Method: 903.0)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for # 2, Ra-226 reported with a positive detect were recalculated and verified using the following equation:

Activity = 32.13 hr from precip → mid count

$$\frac{\text{(cpm - bckgrd cpm)}}{(2.22)(E)(Vol)(CF)}$$

Recalculation:

$$\frac{(357/200) - (41/1000)}{(2.22)(0.18531)(0.49991\ L)(0.696)(1.64)} = 7.429\ pCi/L$$

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

#	Sample ID	Analyte	Reported Concentration (pCi/L)	Calculated Concentration (pCi/L)	Acceptable (Y/N)
1	2	Ra-226	7.40	7.43	Y
					↓
2	5	Ra-226	3.53	3.54	↓

Note:

LDC #: 31685C29b

SDG #: 160-5405-1

Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-29-14

Page: 1 of 1

Reviewer: MG

2nd Reviewer: CR

METHOD: Radium 228 (EPA Method 904.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-31-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII	Field blanks	ND	FB= 3, 4

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

all water

1	LT-R-001-GW	11		21		31	
2	LT-R-002-GW **	12		22		32	
3	FB014	13		23		33	
4	FB015	14		24		34	
5	LT-R-003-GW **	15		25		35	
6	LT-R-001-GWDUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes:

LDC #: 31685C296
SDG #: ~

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method 904.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the required frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / (Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) $\leq$1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685C29b
SDG #: —

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: CR

METHOD: Radiochemistry (Method: 904.0)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ra-228	3.310 (pCi/L)	3.98 (pCi/L)	83	83	Y
—	Matrix spike sample	—	—	—	—	—	—
6	Duplicate RPD	Ra-228	0.535 (pCi/L) ± 0.259	0.1935 U (pCi/L) ± 0.219	RER 0.71	RER 0.71	Y
2	Chemical recovery	Ba Y	0.0287 (g) 0.0218 (g)	0.0339 (g) 0.0249 (g)	84.7 87.6	84.7 87.6	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685C296
SDG #: —

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: MG
2nd reviewer: CSL

METHOD: Radiochemistry (Method: 904.0)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for # 2, Ra-228 reported with a positive detect were recalculated and verified using the following equation:

Activity = $\frac{\text{(cpm - bckgrd cpm)}}{\text{(2.22)(E)(Vol)(CF)}}$

t_1 = 163.2 m
t_2 = 200 m
t_3 = 5655 m

E = Efficiency
Vol = Volume
CF = %R, Self-absorbance, abundance, ect.

Recalculation:

$$\frac{(215/200)-(365/1000)}{(2.22)(0.43936)(0.52198\text{ L})(0.847)(0.876)} \times \frac{0.3768}{0.313947} \times \frac{1}{0.999976} \times \frac{1}{0.735306} = 3.068 \text{ pCi/L}$$

#	Sample ID	Analyte	Reported Concentration (pCi/L)	Calculated Concentration (pCi/L)	Acceptable (Y/N)
1	2	Ra-228	3.07	3.07	Y
2	5	Ra-228	1.80	1.80	↓

Note:

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5405-2
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR Glen Isle Partners, LLC
Date: May 1, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-R-002-GW**	160-5405-4	Ra-226
LT-R-003-GW	160-5405-7	Ra-226

Associated QC Samples(s):
Field Blanks: None Associated
Field Duplicate pair: None Associated

The above-listed water samples were collected on January 31, 2014 and were analyzed for Radium-226 with a 21 day ingrowth by EPA Method 903.0. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

No isotopes were detected above the minimum detectable activity (MDA).

Samples FB014 and FB015 were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

Laboratory duplicates were not associated with this sample set. Validation action was not required on this basis.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31685D29a

SDG #: 160-5405-2

Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

Cat A/Cat B

Date: 4-30-14

Page: 1 of 1

Reviewer: MG

2nd Reviewer: 02

METHOD: Radium 226 (EPA Method 903.0)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-31-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

all water

1	LT-R-002-GW **	11		21		31	
2	LT-R-003-GW	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBW	40	

Notes: 21 day ingrowth

LDC #: 31685D29a

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method 903.0)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / (Water)		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error rations (DER) ≤1.42?.			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 31685D29a

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: 9R

METHOD: Radiochemistry (Method: 903.0)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ra-226	12.92 (pCi/L)	11.2 (pCi/L)	115	115	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
1	Chemical recovery	Ba	0.0236 (g)	0.0339 (g)	69.6	69.6	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685D29a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: CL

METHOD: Radiochemistry (Method: 903.0)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, Ra-226 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

Recalculation:

$$\frac{(168/200) - (86/1000)}{(2.22)(0.19160)(0.49991\,L)(0.696)(4.00)} = 1.274\ pCi/L$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

#	Sample ID	Analyte	Reported Concentration (pCi/L)	Calculated Concentration (pCi/L)	Acceptable (Y/N)
1	1	Ra-226	1.27	1.27	Y

Note:

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5481-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR Glen Isle Partners, LLC
Date: April 30, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-G-019-8-10**	160-5481-1	Gamma Spectroscopy**, Alpha Spectroscopy**
LT-G-019-8-10DUP	160-5481-1DUP	Alpha Spectroscopy

Associated QC Samples(s):
Field Blanks: None Associated
Field Duplicate pair: None Associated

The above-listed soil samples were collected on February 6, 2014 and were analyzed for gamma spectroscopy by method GA-01-R and alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Lead-214	0.01292 pCi/g	<RL	LT-G-019-8-10**

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

No samples were qualified since the associated sample results were greater than the RL.

A field blank was not associated with this sample set. Validation action was not required on this basis.

Alpha Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

A field blank was not associated with this sample set. Validation action was not required on this basis.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

The laboratory performed duplicate analysis on sample LT-G-019-8-10** for alpha spectroscopy. All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31685E35 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-30-14
SDG #: 160-5481-1 Cat A/Cat B Page: 1 of 1
Laboratory : Test America, Inc. Reviewer: MG
2nd Reviewer: QL

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-6-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

soil

1	LT-G-019-8-10 **	11		21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBS	40	

Notes:

LDC #: 31685E35

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: JL

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil / Water.		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error rations (DER) <1.42?.			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 31685E35

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: CR

METHOD: Radiochemistry, Method GA-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: _____ **Associated Samples:** all (>RL)

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		No Qual.										
Pb-214	0.01292												

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31685E35

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: CL

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Cs-137	36.33 (pCi/g)	35.8 (pCi/g)	101	102	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685E35

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: 02

METHOD: Radiochemistry (Method: GA-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, Th-234 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

$$\frac{(13.69\ dps)(27.03\ pCi/dps)}{1067.5\ g} = 0.3466\ pCi/g$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	Th-234	0.347	0.347	Y

Note:

LDC #: 31685E36 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-30-14
SDG #: 160-5481-1 Cat A/Cat B Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer: CR

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 2-6-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	A	DUP
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
N = Not provided/applicable R = Rinsate TB = Trip blank
SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

Soil

1	LT-G-019-8-10 **	11		21		31	
2	LT-G-019-8-10DUP	12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBS	40	

Notes:

LDC #: 31685E36

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: CR

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil) Water.		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) <1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 31685E36

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: [illegible]

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found / True x 100 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Th-230	23.59 (pCi/g)	24.5 (pCi/g)	96	96	Y
—	Matrix spike sample	—	—	—	—	—	—
2	Duplicate RPD	U-238	0.200 (pCi/g) ± 0.0953	0.3431 (pCi/g) ± 0.135	RER 0.62	RER 0.62	Y
1	Chemical recovery	U-232	14.019 (dpm)	16.45 (dpm)	85.2	87.3	↓

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685E36

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: OL

METHOD: Radiochemistry (Method: A-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, Th-230 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

$$\frac{(28/180) - (4.1912/180)}{(2.22)(0.2704)(0.9957g)(0.8404)(0.997)} = 0.2641 \text{ pCi/g}$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	Th-230	0.268	0.264	Y
		U-233/234	0.270	0.270	↓

Note:

Site: Glen Isle
Laboratory: Test America St. Louis, MO
Report No.: 160-5485-1
Reviewer: Christina Rink and Mark Gregg/Laboratory Data Consultants for RXR Glen Isle Partners, LLC
Date: April 30, 2014

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
LT-R-002-0-5**	160-5485-1	Gamma Spectroscopy**, Alpha Spectroscopy**
LT-R-002-5-10	160-5485-2	Gamma Spectroscopy, Alpha Spectroscopy
LT-R-003-5-10	160-5485-3	Gamma Spectroscopy, Alpha Spectroscopy

Associated QC Samples(s):
Field Blanks: FB014, FB015 (both from SDG 160-5405-1)
Field Duplicate pair: None Associated

The above-listed soil samples were collected on January 31, 2014 and were analyzed for gamma spectroscopy by method GA-01-R and alpha spectroscopy for isotopic thorium and isotopic uranium by method A-01-R. The data validation was performed in accordance with the *Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual* (July 2004) and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-10-011* (January 2010), modified as necessary to accommodate the non-CLP methodologies used.

The radiometric data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times
- Instrument Calibration
- Blank Analysis Results
- Chemical Recovery
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix.

Samples indicated by a double asterisk on the front cover underwent Category B review. A Category A review was performed on all of the other samples. Calibration and raw data were not evaluated for the samples reviewed by Category A criteria since this review is based on QC data.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All holding times were met.

Instrument Calibration

All criteria were met for samples on which a Category B review was performed. Calibration data were not evaluated for the samples reviewed by Category A criteria.

Blank Results

Gamma Spectroscopy

Isotopes were detected above the minimum detectable activity (MDA). The presence of activity indicates that false positives may exist for these isotopes in the associated samples. Action Levels (ALs) were established at < RL. The following table summarizes the activities detected.

Blank ID	Isotope	Level Detected	Action Level	Associated Samples
PB (prep blank)	Lead-214	0.01292 pCi/g	<RL	LT-R-002-0-5** LT-R-002-5-10 LT-R-003-5-10

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

No samples were qualified since the associated sample results were greater than the RL.

Samples FB014 and FB015 (both from SDG 160-5405-1) were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Alpha Spectroscopy

No isotopes were detected above the minimum detectable activity (MDA).

Samples FB014 and FB015 (both from SDG 160-5405-1) were identified as field blanks. No analytes were detected above the reporting limits in the field blank sample.

Chemical Recovery

All criteria were met.

Laboratory Duplicate Results

Laboratory duplicates were not associated with this sample set. Validation action was not required on this basis.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Detection Limits Results

All minimum detectable activities met required detection limits.

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 31685F35 **VALIDATION COMPLETENESS WORKSHEET** Date: 4-30-14
SDG #: 160-5485-1 Cat A/Cat B Page: 1 of 1
Laboratory : Test America, Inc. Reviewer: MG
2nd Reviewer: CL

METHOD: Gamma Spectroscopy (Method GA-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-31-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	SW	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Minimum detectable activity (MDA)	A	
VIII.	Sample result verification	A	Not reviewed for Cat A review.
IX.	Overall assessment of data	A	
X.	Field duplicates	N	
XI	Field blanks < RL	ND	FB = FB014, FB015 (SDG: 160-5405-1)

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

all soil

1	LT-R-002-0-5 **	11		21		31	
2	LT-R-002-5-10	12		22		32	
3	LT-R-003-5-10	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBS	40	

Notes:

LDC #: 31685 F35

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: 02

Method: Radiochemistry (EPA Method GA-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil) Water.		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error rations (DER) ≤1.42?.			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?		✓		
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685F35

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer: CC

METHOD: Radiochemistry, Method GA-01-R

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were blank analyses performed as required? If no, please see qualifications below.
(Y) N N/A Were any activities in the blanks greater than the minimum detectable activity? If yes, please see qualifications below.

Conc. units: _____ **Associated Samples:** all (>RL)

Isotope	Blank ID	Blank Action Limit	Sample Identification										
	PB		No Qual.										
Pb-214	0.01292												

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 31685F35

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: MG
2nd Reviewer: 02

METHOD: Radiochemistry (Method: GA-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Am-241	104.4 (pCi/g)	101 (pCi/g)	103	103	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
—	Chemical recovery	—	—	—	—	—	—

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685F35

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: CR

METHOD: Radiochemistry (Method: GA-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, U-235 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

$$\frac{(1.684\ dps)(27.03\ pCi/dps)}{987.7\ g} = 0.04609\ pCi/g$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	U-235	0.0461	0.04609	Y

Note: _____

LDC #: 31685F36
SDG #: 160-5485-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
Cat A/Cat B

Date: 4-30-14
Page: 1 of 1
Reviewer: MG
2nd Reviewer: OL

METHOD: Alpha Spectroscopy (Method A-01-R)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 1-31-14
II.	Initial calibration	A	Not reviewed for Cat A review.
III.	Calibration verification	A	Not reviewed for Cat A review.
IV.	Blanks	A	
V.	Matrix Spike/(Matrix Spike) Duplicates	N	not required
VI.	Laboratory control samples	A	LCS
VII.	Carrier recovery	A	
VIII.	Minimum detectable activity (MDA)	A	
IX.	Sample result verification	A	Not reviewed for Cat A review.
X.	Overall assessment of data	A	
XI.	Field duplicates	N	
XII.	Field blanks < RL	ND	FB= FB014, FB015 (SDG: 160-5405-1)

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ** Indicates sample underwent Cat B review.

all soil

1	LT-R-002-0-5 **	11		21		31	
2	LT-R-002-5-10	12		22		32	
3	LT-R-003-5-10	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30	PBS	40	

Notes:

LDC #: 31685F36

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer: CR

Method: Radiochemistry (EPA Method A-01-R)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP (Soil / Water).		✓		
Were the MS percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error rations (DER) <1.42?.			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 31685 F36

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer: 9

METHOD: Radiochemistry (Method: A-01-R)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found / True x 100 Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	U-233/234	6.329 (pCi/g)	6.37 (pCi/g)	99	99	Y
—	Matrix spike sample	—	—	—	—	—	—
—	Duplicate RPD	—	—	—	—	—	—
1	Chemical recovery	Th-229	12.393 (dpm)	13.59 (dpm)	91.2	91.2	Y

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 31685F36

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer: 02

METHOD: Radiochemistry (Method: A-01-R)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?

Analyte results for #1, Th-228 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

$$\frac{(45/180) - (3.5625/180)}{(2.22)(0.2746)(0.9995g)(0.9121)(0.998)} = 0.4151 \text{ pCi/g}$$

#	Sample ID	Analyte	Reported Concentration (pCi/g)	Calculated Concentration (pCi/g)	Acceptable (Y/N)
1	1	Th-228	0.415	0.415	Y
		U-238	0.451	0.451	↓

Note:

Glen Island Data Gap Field Program - LDC# 31685

SDG: 16052311

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601009021A	1601009021A	THORIUM-230	1/28/2014	0.06449	Yes	Y				0.0502	0.0502	pci/g
1601009021A	1601009021A	THORIUM-228	1/28/2014	-0.004958	Yes	Y	U		U	0.0950	0.0950	pci/g
1601009021A	1601009021A	THORIUM	1/28/2014	-0.006177	Yes	Y	U		U	0.0625	0.0625	pci/g
1601009031A	1601009031A	URANIUM-235	1/27/2014	0	Yes	Y	U		U	0.0363	0.0363	pci/g
1601009031A	1601009031A	URANIUM 233 AND 234	1/27/2014	0.006082	Yes	Y	U		U	0.0506	0.0506	pci/g
1601009031A	1601009031A	URANIUM	1/27/2014	0.01942	Yes	Y	U		U	0.0291	0.0291	pci/g
1601009051A	1601009051A	THORIUM	1/24/2014	0	Yes	Y	U		U	0.0653	0.0653	pci/l
1601009051A	1601009051A	THORIUM-228	1/24/2014	0.05742	Yes	Y	U		U	0.210	0.210	pci/l
1601009051A	1601009051A	THORIUM-230	1/24/2014	0.119	Yes	Y	U		U	0.125	0.125	pci/l
1601009061A	1601009061A	URANIUM 233 AND 234	1/24/2014	-0.006949	Yes	Y	U		U	0.158	0.158	pci/l
1601009061A	1601009061A	URANIUM-235	1/24/2014	-0.01557	Yes	Y	U		U	0.157	0.157	pci/l
1601009061A	1601009061A	URANIUM	1/24/2014	-0.01665	Yes	Y	U		U	0.135	0.135	pci/l
FB003-20140115	160-5231-4	THORIUM-230	1/24/2014	0.461	Yes	Y				0.187	0.187	pci/l
FB003-20140115	160-5231-4	THORIUM	1/24/2014	0.356	Yes	Y				0.188	0.188	pci/l
FB003-20140115	160-5231-4	THORIUM-228	1/24/2014	0.495	Yes	Y				0.184	0.184	pci/l
FB003-20140115	160-5231-4	URANIUM 233 AND 234	1/24/2014	0.0151	Yes	Y	U		U	0.156	0.156	pci/l
FB003-20140115	160-5231-4	URANIUM	1/24/2014	0.0396	Yes	Y	U		U	0.0996	0.0996	pci/l
FB003-20140115	160-5231-4	URANIUM-235	1/24/2014	-0.0307	Yes	Y	U		U	0.185	0.185	pci/l
FB004-20140116	160-5231-1	THORIUM	1/24/2014	0.0314	Yes	Y	U		U	0.124	0.124	pci/l
FB004-20140116	160-5231-1	THORIUM-228	1/24/2014	0.0329	Yes	Y	U		U	0.162	0.162	pci/l
FB004-20140116	160-5231-1	THORIUM-230	1/24/2014	0.147	Yes	Y	U		U	0.156	0.156	pci/l
FB004-20140116	160-5231-1	URANIUM	1/24/2014	0.0388	Yes	Y	U		U	0.0974	0.0974	pci/l
FB004-20140116	160-5231-1	URANIUM 233 AND 234	1/24/2014	0.0134	Yes	Y	U		U	0.111	0.111	pci/l

SDG: 16052311

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB004-20140116	160-5231-1	URANIUM-235	1/24/2014	-0.005	Yes	Y	U		U	0.121	0.121	pci/l
FB004-20140116LR	160-5231-1LR	THORIUM-230	1/24/2014	0.1397	Yes	Y	U		U	0.150	0.150	pci/l
FB004-20140116LR	160-5231-1LR	THORIUM	1/24/2014	0.01008	Yes	Y	U		U	0.131	0.131	pci/l
FB004-20140116LR	160-5231-1LR	THORIUM-228	1/24/2014	0.03038	Yes	Y	U		U	0.177	0.177	pci/l
FB004-20140116LR	160-5231-1LR	URANIUM	1/24/2014	0.002748	Yes	Y	U		U	0.174	0.174	pci/l
FB004-20140116LR	160-5231-1LR	URANIUM 233 AND 234	1/24/2014	-0.001377	Yes	Y	U		U	0.180	0.180	pci/l
FB004-20140116LR	160-5231-1LR	URANIUM-235	1/24/2014	0.01713	Yes	Y	U		U	0.142	0.142	pci/l
LT-C-013-6-8-20140115	160-5231-3	URANIUM 233 AND 234	1/27/2014	0.555	Yes	Y				0.0340	0.0340	pci/g
LT-C-013-6-8-20140115	160-5231-3	URANIUM-235	1/27/2014	0.0397	Yes	Y	U		U	0.0642	0.0642	pci/g
LT-C-013-6-8-20140115	160-5231-3	URANIUM	1/27/2014	0.656	Yes	Y				0.0339	0.0339	pci/g
LT-C-013-6-8-20140115	160-5231-3	THORIUM-230	1/28/2014	0.754	Yes	Y		U	U	0.0761	0.0761	pci/g
LT-C-013-6-8-20140115	160-5231-3	THORIUM-228	1/28/2014	0.734	Yes	Y				0.104	0.104	pci/g
LT-C-013-6-8-20140115	160-5231-3	THORIUM	1/28/2014	0.81	Yes	Y				0.0759	0.0759	pci/g
LT-C-016-8-10-20140116	160-5231-5	URANIUM-235	1/27/2014	0.0144	Yes	Y	U		U	0.0431	0.0431	pci/g
LT-C-016-8-10-20140116	160-5231-5	URANIUM 233 AND 234	1/27/2014	0.582	Yes	Y				0.0656	0.0656	pci/g
LT-C-016-8-10-20140116	160-5231-5	URANIUM	1/27/2014	0.702	Yes	Y				0.0345	0.0345	pci/g
LT-C-016-8-10-20140116	160-5231-5	THORIUM-230	1/28/2014	0.54	Yes	Y		U	U	0.0537	0.0537	pci/g
LT-C-016-8-10-20140116	160-5231-5	THORIUM-228	1/28/2014	1.26	Yes	Y				0.0987	0.0987	pci/g
LT-C-016-8-10-20140116	160-5231-5	THORIUM	1/28/2014	0.885	Yes	Y				0.0667	0.0667	pci/g
LT-X-002-6-8-20140116	160-5231-2	URANIUM-235	1/27/2014	0.00905	Yes	Y	U		U	0.0752	0.0752	pci/g
LT-X-002-6-8-20140116	160-5231-2	URANIUM 233 AND 234	1/27/2014	0.612	Yes	Y				0.0604	0.0604	pci/g
LT-X-002-6-8-20140116	160-5231-2	URANIUM	1/27/2014	0.544	Yes	Y				0.0529	0.0529	pci/g
LT-X-002-6-8-20140116	160-5231-2	THORIUM-228	1/28/2014	0.644	Yes	Y				0.0818	0.0818	pci/g
LT-X-002-6-8-20140116	160-5231-2	THORIUM	1/28/2014	0.7	Yes	Y				0.0484	0.0484	pci/g
LT-X-002-6-8-20140116	160-5231-2	THORIUM-230	1/28/2014	0.671	Yes	Y		U	U	0.0487	0.0487	pci/g

SDG: 16052311

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-X-002-6-8-20140116LR	160-5231-2LR	URANIUM-235	1/27/2014	0.06682	Yes	Y				0.0632	0.0632	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	URANIUM	1/27/2014	0.577	Yes	Y				0.0507	0.0507	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	URANIUM 233 AND 234	1/27/2014	0.5983	Yes	Y				0.0580	0.0580	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	THORIUM	1/28/2014	0.6768	Yes	Y				0.0839	0.0839	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	THORIUM-228	1/28/2014	0.6191	Yes	Y				0.102	0.102	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	THORIUM-230	1/28/2014	0.534	Yes	Y				0.0826	0.0826	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601010831A	1601010831A	BISMUTH-212	1/27/2014	35.16	Yes	Y	U		U	50.8	50.8	pci/l
1601010831A	1601010831A	Protactinium 234	1/27/2014	-266	Yes	Y	U		U	627	627	pci/l
1601010831A	1601010831A	PROTACTINIUM 231	1/27/2014	21.64	Yes	Y	U		U	115	115	pci/l
1601010831A	1601010831A	POTASSIUM-40	1/27/2014	-7.064	Yes	Y	U		U	67.8	67.8	pci/l
1601010831A	1601010831A	BISMUTH-214	1/27/2014	3.208	Yes	Y	U		U	12.3	12.3	pci/l
1601010831A	1601010831A	LEAD-214	1/27/2014	-0.9988	Yes	Y	U		U	10.5	10.5	pci/l
1601010831A	1601010831A	LEAD-212	1/27/2014	1.725	Yes	Y	U		U	8.22	8.22	pci/l
1601010831A	1601010831A	COBALT-60	1/27/2014	0.8825	Yes	Y	U		U	4.63	4.63	pci/l
1601010831A	1601010831A	ACTINIUM 228	1/27/2014	-3.403	Yes	Y	U		U	18.6	18.6	pci/l
1601010831A	1601010831A	AMERICIUM-241	1/27/2014	1.23	Yes	Y	U		U	7.84	7.84	pci/l
1601010831A	1601010831A	CESIUM-137	1/27/2014	1.437	Yes	Y	U		U	3.42	3.42	pci/l
1601010941A	1601010941A	POTASSIUM-40	1/30/2014	-0.04694	Yes	Y	U		U	0.0703	0.0703	pci/g
1601010941A	1601010941A	Protactinium 234	1/30/2014	0.1027	Yes	Y	U		U	0.462	0.462	pci/g
1601010941A	1601010941A	COBALT-60	1/30/2014	-0.00008747	Yes	Y	U		U	0.00370	0.00370	pci/g
1601010941A	1601010941A	RADIUM-226	1/30/2014	0.1602	Yes	Y				0.0525	0.0525	pci/g
1601010941A	1601010941A	LEAD-210	1/30/2014	-0.01034	Yes	Y	U		U	0.0800	0.0800	pci/g

SDG: 16052311

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601010941A	1601010941A	RADIUM-228	1/30/2014	0.01276	Yes	Y				0.0117	0.0117	pci/g
1601010941A	1601010941A	LEAD-212	1/30/2014	0.002053	Yes	Y	U		U	0.00630	0.00630	pci/g
1601010941A	1601010941A	THORIUM-234	1/30/2014	0.0343	Yes	Y	U		U	0.0689	0.0689	pci/g
1601010941A	1601010941A	URANIUM	1/30/2014	0.0343	Yes	Y	U		U	0.0689	0.0689	pci/g
1601010941A	1601010941A	URANIUM-235	1/30/2014	0.0005122	Yes	Y	U		U	0.0174	0.0174	pci/g
1601010941A	1601010941A	BISMUTH-214	1/30/2014	0.002942	Yes	Y	U		U	0.0101	0.0101	pci/g
1601010941A	1601010941A	ACTINIUM 228	1/30/2014	0.01276	Yes	Y				0.0117	0.0117	pci/g
1601010941A	1601010941A	THALLIUM-208	1/30/2014	-0.002247	Yes	Y	U		U	0.00499	0.00499	pci/g
1601010941A	1601010941A	PROTACTINIUM 231	1/30/2014	-0.01627	Yes	Y	U		U	0.0971	0.0971	pci/g
1601010941A	1601010941A	AMERICIUM-241	1/30/2014	0.000089	Yes	Y	U		U	0.00635	0.00635	pci/g
1601010941A	1601010941A	CESIUM-137	1/30/2014	0.001075	Yes	Y	U		U	0.00335	0.00335	pci/g
1601010941A	1601010941A	LEAD-214	1/30/2014	-0.002545	Yes	Y	U		U	0.00931	0.00931	pci/g
1601010941A	1601010941A	BISMUTH-212	1/30/2014	0.02727	Yes	Y	U		U	0.0434	0.0434	pci/g
FB003-20140115	160-5231-4	ACTINIUM 228	1/24/2014	-7.74	Yes	Y	U		U	16.7	16.7	pci/l
FB003-20140115	160-5231-4	BISMUTH-212	1/24/2014	-1.09	Yes	Y	U		U	68.1	68.1	pci/l
FB003-20140115	160-5231-4	BISMUTH-214	1/24/2014	-7.07	Yes	Y	U		U	11.8	11.8	pci/l
FB003-20140115	160-5231-4	LEAD-214	1/24/2014	5.85	Yes	Y	U		U	8.85	8.85	pci/l
FB003-20140115	160-5231-4	POTASSIUM-40	1/24/2014	-74.2	Yes	Y	U		U	83.0	83.0	pci/l
FB003-20140115	160-5231-4	PROTACTINIUM 231	1/24/2014	33.7	Yes	Y	U		U	108	108	pci/l
FB003-20140115	160-5231-4	Protactinium 234	1/24/2014	427	Yes	Y	U		U	505	505	pci/l
FB003-20140115	160-5231-4	CESIUM-137	1/24/2014	-0.508	Yes	Y	U		U	5.36	5.36	pci/l
FB003-20140115	160-5231-4	LEAD-212	1/24/2014	-2.67	Yes	Y	U		U	7.63	7.63	pci/l
FB004-20140116	160-5231-1	Protactinium 234	1/24/2014	197	Yes	Y	U		U	523	523	pci/l
FB004-20140116	160-5231-1	CESIUM-137	1/24/2014	1.33	Yes	Y	U		U	4.02	4.02	pci/l
FB004-20140116	160-5231-1	BISMUTH-214	1/24/2014	-8.23	Yes	Y	U		U	12.1	12.1	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB004-20140116	160-5231-1	PROTACTINIUM 231	1/24/2014	-44.1	Yes	Y	U		U	123	123	pci/l
FB004-20140116	160-5231-1	BISMUTH-212	1/24/2014	4.45	Yes	Y	U		U	46.5	46.5	pci/l
FB004-20140116	160-5231-1	ACTINIUM 228	1/24/2014	9.77	Yes	Y	U		U	15.1	15.1	pci/l
FB004-20140116	160-5231-1	POTASSIUM-40	1/24/2014	27.4	Yes	Y	U		U	66.7	66.7	pci/l
FB004-20140116	160-5231-1	LEAD-214	1/24/2014	0.857	Yes	Y	U		U	9.98	9.98	pci/l
FB004-20140116	160-5231-1	LEAD-212	1/24/2014	-0.323	Yes	Y	U		U	7.29	7.29	pci/l
FB004-20140116LR	160-5231-1LR	POTASSIUM-40	1/26/2014	-33.92	Yes	Y	U		U	76.1	76.1	pci/l
FB004-20140116LR	160-5231-1LR	LEAD-214	1/26/2014	-0.1608	Yes	Y	U		U	11.4	11.4	pci/l
FB004-20140116LR	160-5231-1LR	LEAD-212	1/26/2014	5.778	Yes	Y	U		U	8.38	8.38	pci/l
FB004-20140116LR	160-5231-1LR	PROTACTINIUM 231	1/26/2014	-16.77	Yes	Y	U		U	127	127	pci/l
FB004-20140116LR	160-5231-1LR	ACTINIUM 228	1/26/2014	-3.633	Yes	Y	U		U	18.3	18.3	pci/l
FB004-20140116LR	160-5231-1LR	Protactinium 234	1/26/2014	-380.1	Yes	Y	U		U	626	626	pci/l
FB004-20140116LR	160-5231-1LR	COBALT-60	1/26/2014	0.7159	Yes	Y	U		U	3.87	3.87	pci/l
FB004-20140116LR	160-5231-1LR	AMERICIUM-241	1/26/2014	2.546	Yes	Y	U		U	8.58	8.58	pci/l
FB004-20140116LR	160-5231-1LR	CESIUM-137	1/26/2014	0.02053	Yes	Y	U		U	4.11	4.11	pci/l
FB004-20140116LR	160-5231-1LR	BISMUTH-214	1/26/2014	4.895	Yes	Y	U		U	12.0	12.0	pci/l
FB004-20140116LR	160-5231-1LR	BISMUTH-212	1/26/2014	9.396	Yes	Y	U		U	52.0	52.0	pci/l
LT-C-013-6-8-20140115	160-5231-3	RADIUM-226	1/30/2014	1.31	Yes	Y				0.379	0.379	pci/g
LT-C-013-6-8-20140115	160-5231-3	URANIUM-235	1/30/2014	0.0468	Yes	Y	U		U	0.118	0.118	pci/g
LT-C-013-6-8-20140115	160-5231-3	URANIUM	1/30/2014	0.834	Yes	Y				0.435	0.435	pci/g
LT-C-013-6-8-20140115	160-5231-3	THORIUM-234	1/30/2014	0.834	Yes	Y				0.435	0.435	pci/g
LT-C-013-6-8-20140115	160-5231-3	RADIUM-228	1/30/2014	0.711	Yes	Y		U	U	0.0577	0.0577	pci/g
LT-C-013-6-8-20140115	160-5231-3	Protactinium 234	1/30/2014	0.908	Yes	Y	U		U	2.23	2.23	pci/g
LT-C-013-6-8-20140115	160-5231-3	PROTACTINIUM 231	1/30/2014	-0.299	Yes	Y	U		U	0.583	0.583	pci/g
LT-C-013-6-8-20140115	160-5231-3	POTASSIUM-40	1/30/2014	8.68	Yes	Y				0.221	0.221	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-C-013-6-8-20140115	160-5231-3	LEAD-214	1/30/2014	0.699	Yes	Y				0.0389	0.0389	pci/g
LT-C-013-6-8-20140115	160-5231-3	LEAD-212	1/30/2014	0.734	Yes	Y				0.0297	0.0297	pci/g
LT-C-013-6-8-20140115	160-5231-3	LEAD-210	1/30/2014	0.555	Yes	Y				0.539	0.539	pci/g
LT-C-013-6-8-20140115	160-5231-3	BISMUTH-214	1/30/2014	0.613	Yes	Y				0.0421	0.0421	pci/g
LT-C-013-6-8-20140115	160-5231-3	BISMUTH-212	1/30/2014	0.715	Yes	Y				0.207	0.207	pci/g
LT-C-013-6-8-20140115	160-5231-3	ACTINIUM 228	1/30/2014	0.711	Yes	Y				0.0577	0.0577	pci/g
LT-C-013-6-8-20140115	160-5231-3	THALLIUM-208	1/30/2014	0.231	Yes	Y				0.0182	0.0182	pci/g
LT-C-016-8-10-20140116	160-5231-5	LEAD-210	1/30/2014	0.346	Yes	Y				0.131	0.131	pci/g
LT-C-016-8-10-20140116	160-5231-5	Protactinium 234	1/30/2014	0.939	Yes	Y	U		U	1.04	1.04	pci/g
LT-C-016-8-10-20140116	160-5231-5	LEAD-214	1/30/2014	0.504	Yes	Y				0.0153	0.0153	pci/g
LT-C-016-8-10-20140116	160-5231-5	RADIUM-228	1/30/2014	0.648	Yes	Y		U	U	0.0289	0.0289	pci/g
LT-C-016-8-10-20140116	160-5231-5	ACTINIUM 228	1/30/2014	0.648	Yes	Y				0.0289	0.0289	pci/g
LT-C-016-8-10-20140116	160-5231-5	BISMUTH-212	1/30/2014	0.708	Yes	Y				0.0982	0.0982	pci/g
LT-C-016-8-10-20140116	160-5231-5	BISMUTH-214	1/30/2014	0.48	Yes	Y				0.0152	0.0152	pci/g
LT-C-016-8-10-20140116	160-5231-5	PROTACTINIUM 231	1/30/2014	-0.24	Yes	Y	U		U	0.214	0.214	pci/g
LT-C-016-8-10-20140116	160-5231-5	LEAD-212	1/30/2014	0.696	Yes	Y				0.0108	0.0108	pci/g
LT-C-016-8-10-20140116	160-5231-5	RADIUM-226	1/30/2014	1.17	Yes	Y				0.162	0.162	pci/g
LT-C-016-8-10-20140116	160-5231-5	THALLIUM-208	1/30/2014	0.215	Yes	Y				0.00810	0.00810	pci/g
LT-C-016-8-10-20140116	160-5231-5	THORIUM-234	1/30/2014	0.495	Yes	Y				0.161	0.161	pci/g
LT-C-016-8-10-20140116	160-5231-5	URANIUM	1/30/2014	0.495	Yes	Y				0.161	0.161	pci/g
LT-C-016-8-10-20140116	160-5231-5	POTASSIUM-40	1/30/2014	10.7	Yes	Y				0.0813	0.0813	pci/g
LT-C-016-8-10-20140116	160-5231-5	URANIUM-235	1/30/2014	0.0395	Yes	Y				0.0366	0.0366	pci/g
LT-X-002-6-8-20140116	160-5231-2	URANIUM-235	1/30/2014	0.0333	Yes	Y				0.0311	0.0311	pci/g
LT-X-002-6-8-20140116	160-5231-2	URANIUM	1/30/2014	0.445	Yes	Y				0.160	0.160	pci/g
LT-X-002-6-8-20140116	160-5231-2	THALLIUM-208	1/30/2014	0.162	Yes	Y				0.00721	0.00721	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-X-002-6-8-20140116	160-5231-2	Protactinium 234	1/30/2014	0.17	Yes	Y	U		U	0.933	0.933	pci/g
LT-X-002-6-8-20140116	160-5231-2	PROTACTINIUM 231	1/30/2014	-0.148	Yes	Y	U		U	0.190	0.190	pci/g
LT-X-002-6-8-20140116	160-5231-2	THORIUM-234	1/30/2014	0.445	Yes	Y				0.160	0.160	pci/g
LT-X-002-6-8-20140116	160-5231-2	RADIUM-226	1/30/2014	0.972	Yes	Y		U	U	0.148	0.148	pci/g
LT-X-002-6-8-20140116	160-5231-2	POTASSIUM-40	1/30/2014	8.8	Yes	Y				0.0773	0.0773	pci/g
LT-X-002-6-8-20140116	160-5231-2	LEAD-214	1/30/2014	0.446	Yes	Y				0.0134	0.0134	pci/g
LT-X-002-6-8-20140116	160-5231-2	LEAD-212	1/30/2014	0.495	Yes	Y				0.0124	0.0124	pci/g
LT-X-002-6-8-20140116	160-5231-2	LEAD-210	1/30/2014	0.499	Yes	Y				0.150	0.150	pci/g
LT-X-002-6-8-20140116	160-5231-2	RADIUM-228	1/30/2014	0.49	Yes	Y		U	U	0.0229	0.0229	pci/g
LT-X-002-6-8-20140116	160-5231-2	BISMUTH-214	1/30/2014	0.397	Yes	Y				0.0139	0.0139	pci/g
LT-X-002-6-8-20140116	160-5231-2	BISMUTH-212	1/30/2014	0.535	Yes	Y				0.0826	0.0826	pci/g
LT-X-002-6-8-20140116	160-5231-2	ACTINIUM 228	1/30/2014	0.49	Yes	Y				0.0229	0.0229	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	RADIUM-226	1/30/2014	1.051	Yes	Y				0.135	0.135	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	PROTACTINIUM 231	1/30/2014	-0.2472	Yes	Y	U		U	0.191	0.191	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	POTASSIUM-40	1/30/2014	8.764	Yes	Y				0.0731	0.0731	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	Protactinium 234	1/30/2014	0.7874	Yes	Y	U		U	0.822	0.822	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	LEAD-214	1/30/2014	0.4428	Yes	Y				0.0142	0.0142	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	ACTINIUM 228	1/30/2014	0.4772	Yes	Y				0.0213	0.0213	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	AMERICIUM-241	1/30/2014	0.00131	Yes	Y	U		U	0.0124	0.0124	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	RADIUM-228	1/30/2014	0.4772	Yes	Y				0.0213	0.0213	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	LEAD-212	1/30/2014	0.5234	Yes	Y				0.0104	0.0104	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	THALLIUM-208	1/30/2014	0.1526	Yes	Y				0.00657	0.00657	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	THORIUM-234	1/30/2014	0.4315	Yes	Y				0.138	0.138	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	URANIUM	1/30/2014	0.4315	Yes	Y				0.138	0.138	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	URANIUM-235	1/30/2014	0.04212	Yes	Y				0.0325	0.0325	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-X-002-6-8-20140116LR	160-5231-2LR	BISMUTH-214	1/30/2014	0.3967	Yes	Y				0.0110	0.0110	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	CESIUM-137	1/30/2014	0.000103	Yes	Y	U		U	0.00729	0.00729	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	BISMUTH-212	1/30/2014	0.5792	Yes	Y				0.0830	0.0830	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	LEAD-210	1/30/2014	0.3849	Yes	Y				0.143	0.143	pci/g
LT-X-002-6-8-20140116LR	160-5231-2LR	COBALT-60	1/30/2014	0.00008147	Yes	Y	U		U	0.00864	0.00864	pci/g

Analytical Method E903.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601034751A	1601034751A	RADIUM-226	2/11/2014	0.06645	Yes	Y	U		U	0.158	0.158	pci/l
FB003-20140115	160-5231-4	RADIUM-226	2/11/2014	0.033	Yes	Y	U		U	0.153	0.153	pci/l
FB004-20140116	160-5231-1	RADIUM-226	2/11/2014	0.0419	Yes	Y	U		U	0.152	0.152	pci/l

Analytical Method E904.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601033121A	1601033121A	RADIUM-228	2/10/2014	-0.05795	Yes	Y	U		U	0.300	0.300	pci/l
FB003-20140115	160-5231-4	RADIUM-228	2/10/2014	0.142	Yes	Y	U		U	0.356	0.356	pci/l
FB004-20140116	160-5231-1	RADIUM-228	2/10/2014	0.214	Yes	Y	U		U	0.326	0.326	pci/l

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Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601044961A	1601044961A	THORIUM	2/19/2014	-0.003879	Yes	Y	U		U	0.0537	0.0537	pci/g
1601044961A	1601044961A	THORIUM-228	2/19/2014	0.04611	Yes	Y	U		U	0.101	0.101	pci/g
1601044961A	1601044961A	THORIUM-230	2/19/2014	0.06597	Yes	Y	U		U	0.0787	0.0787	pci/g
1601044971A	1601044971A	URANIUM	2/19/2014	0.06071	Yes	Y				0.0561	0.0561	pci/g
1601044971A	1601044971A	URANIUM 233 AND 234	2/19/2014	0.06962	Yes	Y				0.0615	0.0615	pci/g
1601044971A	1601044971A	URANIUM-235	2/19/2014	0	Yes	Y	U		U	0.0404	0.0404	pci/g
1601045141A	1601045141A	THORIUM-230	2/17/2014	0.1357	Yes	Y				0.0292	0.0292	pci/l
1601045141A	1601045141A	THORIUM-228	2/17/2014	0.08048	Yes	Y	U		U	0.127	0.127	pci/l
1601045141A	1601045141A	THORIUM	2/17/2014	0.001208	Yes	Y	U		U	0.0535	0.0535	pci/l
1601045161A	1601045161A	URANIUM	2/14/2014	0	Yes	Y	U		U	0.0493	0.0493	pci/l
1601045161A	1601045161A	URANIUM 233 AND 234	2/14/2014	0.008228	Yes	Y	U		U	0.0922	0.0922	pci/l
1601045161A	1601045161A	URANIUM-235	2/14/2014	0.01024	Yes	Y	U		U	0.115	0.115	pci/l
DUP008-20140128	160-5365-3	THORIUM	2/19/2014	0.428	Yes	Y				0.0591	0.0591	pci/g
DUP008-20140128	160-5365-3	THORIUM-228	2/19/2014	0.767	Yes	Y				0.103	0.103	pci/g
DUP008-20140128	160-5365-3	THORIUM-230	2/19/2014	0.527	Yes	Y				0.0739	0.0739	pci/g
DUP008-20140128	160-5365-3	URANIUM 233 AND 234	2/19/2014	0.71	Yes	Y		U	U	0.0867	0.0867	pci/g
DUP008-20140128	160-5365-3	URANIUM-235	2/19/2014	0.021	Yes	Y	U		U	0.0831	0.0831	pci/g
DUP008-20140128	160-5365-3	URANIUM	2/19/2014	0.735	Yes	Y		U	U	0.0533	0.0533	pci/g
FB011-20140128	160-5365-2	URANIUM	2/14/2014	0.018	Yes	Y	U		U	0.0541	0.0541	pci/l
FB011-20140128	160-5365-2	URANIUM 233 AND 234	2/14/2014	0.0542	Yes	Y	U		U	0.121	0.121	pci/l
FB011-20140128	160-5365-2	URANIUM-235	2/14/2014	0.0169	Yes	Y	U		U	0.109	0.109	pci/l
FB011-20140128	160-5365-2	THORIUM	2/18/2014	0.0128	Yes	Y	U		U	0.0721	0.0721	pci/l
FB011-20140128	160-5365-2	THORIUM-230	2/18/2014	0.135	Yes	Y		U	U	0.0725	0.0725	pci/l
FB011-20140128	160-5365-2	THORIUM-228	2/18/2014	0.0345	Yes	Y	U		U	0.138	0.138	pci/l
LT-G-029-2-4-20140128	160-5365-1	THORIUM	2/19/2014	0.852	Yes	Y				0.0663	0.0663	pci/g

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Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-G-029-2-4-20140128	160-5365-1	THORIUM-228	2/19/2014	0.844	Yes	Y				0.0672	0.0672	pci/g
LT-G-029-2-4-20140128	160-5365-1	THORIUM-230	2/19/2014	0.882	Yes	Y				0.0614	0.0614	pci/g
LT-G-029-2-4-20140128	160-5365-1	URANIUM	2/19/2014	0.516	Yes	Y		U	U	0.0632	0.0632	pci/g
LT-G-029-2-4-20140128	160-5365-1	URANIUM-235	2/19/2014	0.0225	Yes	Y	U		U	0.0720	0.0720	pci/g
LT-G-029-2-4-20140128	160-5365-1	URANIUM 233 AND 234	2/19/2014	0.561	Yes	Y		U	U	0.0633	0.0633	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601028301A	1601028301A	Protactinium 234	2/3/2014	172.2	Yes	Y	U		U	424	424	pci/l
1601028301A	1601028301A	AMERICIUM-241	2/3/2014	1.33	Yes	Y	U		U	6.50	6.50	pci/l
1601028301A	1601028301A	BISMUTH-212	2/3/2014	14.26	Yes	Y	U		U	49.0	49.0	pci/l
1601028301A	1601028301A	BISMUTH-214	2/3/2014	-4.361	Yes	Y	U		U	10.9	10.9	pci/l
1601028301A	1601028301A	CESIUM-137	2/3/2014	1.253	Yes	Y	U		U	4.08	4.08	pci/l
1601028301A	1601028301A	COBALT-60	2/3/2014	1.845	Yes	Y	U		U	4.40	4.40	pci/l
1601028301A	1601028301A	LEAD-212	2/3/2014	1.946	Yes	Y	U		U	6.66	6.66	pci/l
1601028301A	1601028301A	LEAD-214	2/3/2014	-0.3544	Yes	Y	U		U	9.67	9.67	pci/l
1601028301A	1601028301A	POTASSIUM-40	2/3/2014	-36.92	Yes	Y	U		U	68.3	68.3	pci/l
1601028301A	1601028301A	PROTACTINIUM 231	2/3/2014	-12.3	Yes	Y	U		U	110	110	pci/l
1601028301A	1601028301A	ACTINIUM 228	2/3/2014	4.266	Yes	Y	U		U	14.9	14.9	pci/l
1601031511A	1601031511A	RADIUM-228	2/5/2014	0.009104	Yes	Y	U		U	0.0112	0.0112	pci/g
1601031511A	1601031511A	CESIUM-137	2/5/2014	0.000744	Yes	Y	U		U	0.00348	0.00348	pci/g
1601031511A	1601031511A	URANIUM	2/5/2014	0.0349	Yes	Y	U		U	0.0713	0.0713	pci/g
1601031511A	1601031511A	BISMUTH-214	2/5/2014	0.0006902	Yes	Y	U		U	0.0101	0.0101	pci/g
1601031511A	1601031511A	THALLIUM-208	2/5/2014	0.001491	Yes	Y	U		U	0.00408	0.00408	pci/g
1601031511A	1601031511A	RADIUM-226	2/5/2014	0.04345	Yes	Y	U		U	0.0773	0.0773	pci/g

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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601031511A	1601031511A	Protactinium 234	2/5/2014	-0.2817	Yes	Y	U		U	0.550	0.550	pci/g
1601031511A	1601031511A	PROTACTINIUM 231	2/5/2014	0.008435	Yes	Y	U		U	0.0974	0.0974	pci/g
1601031511A	1601031511A	POTASSIUM-40	2/5/2014	0.00395	Yes	Y	U		U	0.0479	0.0479	pci/g
1601031511A	1601031511A	LEAD-214	2/5/2014	-0.001663	Yes	Y	U		U	0.00876	0.00876	pci/g
1601031511A	1601031511A	LEAD-212	2/5/2014	-0.0009042	Yes	Y	U		U	0.00620	0.00620	pci/g
1601031511A	1601031511A	LEAD-210	2/5/2014	0.01563	Yes	Y	U		U	0.0930	0.0930	pci/g
1601031511A	1601031511A	COBALT-60	2/5/2014	0.001131	Yes	Y	U		U	0.00352	0.00352	pci/g
1601031511A	1601031511A	ACTINIUM 228	2/5/2014	0.009104	Yes	Y	U		U	0.0112	0.0112	pci/g
1601031511A	1601031511A	THORIUM-234	2/5/2014	0.0349	Yes	Y	U		U	0.0713	0.0713	pci/g
1601031511A	1601031511A	URANIUM-235	2/5/2014	0.0162	Yes	Y				0.0125	0.0125	pci/g
1601031511A	1601031511A	BISMUTH-212	2/5/2014	0.01444	Yes	Y	U		U	0.0327	0.0327	pci/g
1601031511A	1601031511A	AMERICIUM-241	2/5/2014	0.001327	Yes	Y	U		U	0.00634	0.00634	pci/g
DUP008-20140128	160-5365-3	Protactinium 234	2/5/2014	2.26	Yes	Y				1.47	1.47	pci/g
DUP008-20140128	160-5365-3	ACTINIUM 228	2/5/2014	0.852	Yes	Y				0.0392	0.0392	pci/g
DUP008-20140128	160-5365-3	BISMUTH-212	2/5/2014	0.971	Yes	Y				0.117	0.117	pci/g
DUP008-20140128	160-5365-3	BISMUTH-214	2/5/2014	0.644	Yes	Y				0.0264	0.0264	pci/g
DUP008-20140128	160-5365-3	LEAD-210	2/5/2014	0.743	Yes	Y				0.214	0.214	pci/g
DUP008-20140128	160-5365-3	LEAD-212	2/5/2014	0.934	Yes	Y				0.0180	0.0180	pci/g
DUP008-20140128	160-5365-3	LEAD-214	2/5/2014	0.696	Yes	Y				0.0230	0.0230	pci/g
DUP008-20140128	160-5365-3	PROTACTINIUM 231	2/5/2014	-0.349	Yes	Y	U		U	0.339	0.339	pci/g
DUP008-20140128	160-5365-3	RADIUM-226	2/5/2014	1.65	Yes	Y				0.241	0.241	pci/g
DUP008-20140128	160-5365-3	URANIUM-235	2/5/2014	0.0803	Yes	Y		U	U	0.0507	0.0507	pci/g
DUP008-20140128	160-5365-3	THALLIUM-208	2/5/2014	0.315	Yes	Y				0.0124	0.0124	pci/g
DUP008-20140128	160-5365-3	THORIUM-234	2/5/2014	0.805	Yes	Y				0.248	0.248	pci/g
DUP008-20140128	160-5365-3	URANIUM	2/5/2014	0.805	Yes	Y				0.248	0.248	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
DUP008-20140128	160-5365-3	RADIUM-228	2/5/2014	0.852	Yes	Y				0.0392	0.0392	pci/g
DUP008-20140128	160-5365-3	POTASSIUM-40	2/5/2014	14.8	Yes	Y				0.117	0.117	pci/g
DUP008-20140128LR	160-5365-3LR	LEAD-210	2/6/2014	0.6893	Yes	Y				0.212	0.212	pci/g
DUP008-20140128LR	160-5365-3LR	LEAD-212	2/6/2014	1.01	Yes	Y				0.0177	0.0177	pci/g
DUP008-20140128LR	160-5365-3LR	ACTINIUM 228	2/6/2014	0.9402	Yes	Y				0.0412	0.0412	pci/g
DUP008-20140128LR	160-5365-3LR	LEAD-214	2/6/2014	0.752	Yes	Y				0.0234	0.0234	pci/g
DUP008-20140128LR	160-5365-3LR	POTASSIUM-40	2/6/2014	15.44	Yes	Y				0.125	0.125	pci/g
DUP008-20140128LR	160-5365-3LR	PROTACTINIUM 231	2/6/2014	-0.2448	Yes	Y	U		U	0.336	0.336	pci/g
DUP008-20140128LR	160-5365-3LR	URANIUM-235	2/6/2014	0.08139	Yes	Y				0.0509	0.0509	pci/g
DUP008-20140128LR	160-5365-3LR	THALLIUM-208	2/6/2014	0.3116	Yes	Y				0.0119	0.0119	pci/g
DUP008-20140128LR	160-5365-3LR	RADIUM-228	2/6/2014	0.9402	Yes	Y				0.0412	0.0412	pci/g
DUP008-20140128LR	160-5365-3LR	RADIUM-226	2/6/2014	1.804	Yes	Y				0.249	0.249	pci/g
DUP008-20140128LR	160-5365-3LR	Protactinium 234	2/6/2014	2.426	Yes	Y				1.53	1.53	pci/g
DUP008-20140128LR	160-5365-3LR	COBALT-60	2/6/2014	0.001185	Yes	Y	U		U	0.0124	0.0124	pci/g
DUP008-20140128LR	160-5365-3LR	CESIUM-137	2/6/2014	0.0001238	Yes	Y	U		U	0.0141	0.0141	pci/g
DUP008-20140128LR	160-5365-3LR	BISMUTH-214	2/6/2014	0.6875	Yes	Y				0.0241	0.0241	pci/g
DUP008-20140128LR	160-5365-3LR	AMERICIUM-241	2/6/2014	0.007794	Yes	Y	U		U	0.0296	0.0296	pci/g
DUP008-20140128LR	160-5365-3LR	URANIUM	2/6/2014	0.7137	Yes	Y				0.255	0.255	pci/g
DUP008-20140128LR	160-5365-3LR	THORIUM-234	2/6/2014	0.7137	Yes	Y				0.255	0.255	pci/g
DUP008-20140128LR	160-5365-3LR	BISMUTH-212	2/6/2014	1.046	Yes	Y				0.166	0.166	pci/g
FB011-20140128	160-5365-2	PROTACTINIUM 231	2/3/2014	43	Yes	Y	U		U	92.8	92.8	pci/l
FB011-20140128	160-5365-2	ACTINIUM 228	2/3/2014	7.93	Yes	Y	U		U	15.0	15.0	pci/l
FB011-20140128	160-5365-2	BISMUTH-212	2/3/2014	23	Yes	Y	U		U	54.5	54.5	pci/l
FB011-20140128	160-5365-2	BISMUTH-214	2/3/2014	-6.75	Yes	Y	U		U	12.3	12.3	pci/l
FB011-20140128	160-5365-2	CESIUM-137	2/3/2014	1.23	Yes	Y	U		U	4.78	4.78	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB011-20140128	160-5365-2	LEAD-212	2/3/2014	1.31	Yes	Y	U		U	7.39	7.39	pci/l
FB011-20140128	160-5365-2	POTASSIUM-40	2/3/2014	-62	Yes	Y	U		U	83.3	83.3	pci/l
FB011-20140128	160-5365-2	Protactinium 234	2/3/2014	85.4	Yes	Y	U		U	775	775	pci/l
FB011-20140128	160-5365-2	LEAD-214	2/3/2014	3.8	Yes	Y	U		U	7.96	7.96	pci/l
FB011-20140128LR	160-5365-2LR	BISMUTH-212	2/3/2014	14.64	Yes	Y	U		U	46.8	46.8	pci/l
FB011-20140128LR	160-5365-2LR	ACTINIUM 228	2/3/2014	6.573	Yes	Y	U		U	12.4	12.4	pci/l
FB011-20140128LR	160-5365-2LR	Protactinium 234	2/3/2014	-291.1	Yes	Y	U		U	567	567	pci/l
FB011-20140128LR	160-5365-2LR	AMERICIUM-241	2/3/2014	-0.08984	Yes	Y	U		U	7.95	7.95	pci/l
FB011-20140128LR	160-5365-2LR	BISMUTH-214	2/3/2014	1.876	Yes	Y	U		U	10.4	10.4	pci/l
FB011-20140128LR	160-5365-2LR	CESIUM-137	2/3/2014	0.4787	Yes	Y	U		U	3.68	3.68	pci/l
FB011-20140128LR	160-5365-2LR	COBALT-60	2/3/2014	0.8132	Yes	Y	U		U	4.31	4.31	pci/l
FB011-20140128LR	160-5365-2LR	LEAD-212	2/3/2014	-1.257	Yes	Y	U		U	7.47	7.47	pci/l
FB011-20140128LR	160-5365-2LR	LEAD-214	2/3/2014	-3.641	Yes	Y	U		U	9.41	9.41	pci/l
FB011-20140128LR	160-5365-2LR	POTASSIUM-40	2/3/2014	35.96	Yes	Y	U		U	54.1	54.1	pci/l
FB011-20140128LR	160-5365-2LR	PROTACTINIUM 231	2/3/2014	20.6	Yes	Y	U		U	101	101	pci/l
LT-G-029-2-4-20140128	160-5365-1	RADIUM-228	2/5/2014	1.18	Yes	Y				0.0404	0.0404	pci/g
LT-G-029-2-4-20140128	160-5365-1	ACTINIUM 228	2/5/2014	1.18	Yes	Y				0.0404	0.0404	pci/g
LT-G-029-2-4-20140128	160-5365-1	URANIUM-235	2/5/2014	0.0953	Yes	Y		U	U	0.0584	0.0584	pci/g
LT-G-029-2-4-20140128	160-5365-1	URANIUM	2/5/2014	1.06	Yes	Y				0.266	0.266	pci/g
LT-G-029-2-4-20140128	160-5365-1	THALLIUM-208	2/5/2014	0.393	Yes	Y				0.0142	0.0142	pci/g
LT-G-029-2-4-20140128	160-5365-1	RADIUM-226	2/5/2014	2.44	Yes	Y				0.262	0.262	pci/g
LT-G-029-2-4-20140128	160-5365-1	Protactinium 234	2/5/2014	2.58	Yes	Y				1.38	1.38	pci/g
LT-G-029-2-4-20140128	160-5365-1	PROTACTINIUM 231	2/5/2014	-0.398	Yes	Y	U		U	0.382	0.382	pci/g
LT-G-029-2-4-20140128	160-5365-1	POTASSIUM-40	2/5/2014	20.4	Yes	Y				0.131	0.131	pci/g
LT-G-029-2-4-20140128	160-5365-1	LEAD-214	2/5/2014	0.93	Yes	Y				0.0264	0.0264	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-G-029-2-4-20140128	160-5365-1	LEAD-212	2/5/2014	1.26	Yes	Y				0.0182	0.0182	pci/g
LT-G-029-2-4-20140128	160-5365-1	LEAD-210	2/5/2014	0.891	Yes	Y				0.207	0.207	pci/g
LT-G-029-2-4-20140128	160-5365-1	BISMUTH-214	2/5/2014	0.832	Yes	Y				0.0256	0.0256	pci/g
LT-G-029-2-4-20140128	160-5365-1	BISMUTH-212	2/5/2014	1.17	Yes	Y				0.155	0.155	pci/g
LT-G-029-2-4-20140128	160-5365-1	THORIUM-234	2/5/2014	1.06	Yes	Y				0.266	0.266	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601034751A	1601034751A	RADIUM-226	2/11/2014	0.06645	Yes	Y	U		U	0.158	0.158	pci/l
FB011-20140128	160-5365-2	RADIUM-226	2/12/2014	0.136	Yes	Y				0.122	0.122	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601033121A	1601033121A	RADIUM-228	2/10/2014	-0.05795	Yes	Y	U		U	0.300	0.300	pci/l
FB011-20140128	160-5365-2	RADIUM-228	2/10/2014	0.108	Yes	Y	U		U	0.304	0.304	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601044961A	1601044961A	THORIUM-230	2/19/2014	0.06597	Yes	Y	U		U	0.0787	0.0787	pci/g
1601044961A	1601044961A	THORIUM-228	2/19/2014	0.04611	Yes	Y	U		U	0.101	0.101	pci/g
1601044961A	1601044961A	THORIUM	2/19/2014	-0.003879	Yes	Y	U		U	0.0537	0.0537	pci/g
1601044971A	1601044971A	URANIUM 233 AND 234	2/19/2014	0.06962	Yes	Y				0.0615	0.0615	pci/g
1601044971A	1601044971A	URANIUM-235	2/19/2014	0	Yes	Y	U		U	0.0404	0.0404	pci/g
1601044971A	1601044971A	URANIUM	2/19/2014	0.06071	Yes	Y				0.0561	0.0561	pci/g
1601045141A	1601045141A	THORIUM-230	2/17/2014	0.1357	Yes	Y				0.0292	0.0292	pci/l
1601045141A	1601045141A	THORIUM	2/17/2014	0.001208	Yes	Y	U		U	0.0535	0.0535	pci/l
1601045141A	1601045141A	THORIUM-228	2/17/2014	0.08048	Yes	Y	U		U	0.127	0.127	pci/l
1601045161A	1601045161A	URANIUM	2/14/2014	0	Yes	Y	U		U	0.0493	0.0493	pci/l
1601045161A	1601045161A	URANIUM 233 AND 234	2/14/2014	0.008228	Yes	Y	U		U	0.0922	0.0922	pci/l
1601045161A	1601045161A	URANIUM-235	2/14/2014	0.01024	Yes	Y	U		U	0.115	0.115	pci/l
FB014-20140131	160-5405-5	URANIUM-235	2/14/2014	0	Yes	Y	U		U	0.0651	0.0651	pci/l
FB014-20140131	160-5405-5	URANIUM 233 AND 234	2/14/2014	0.0436	Yes	Y	U		U	0.0977	0.0977	pci/l
FB014-20140131	160-5405-5	URANIUM	2/14/2014	0	Yes	Y	U		U	0.0522	0.0522	pci/l
FB014-20140131	160-5405-5	THORIUM	2/17/2014	0.0229	Yes	Y	U		U	0.0343	0.0343	pci/l
FB014-20140131	160-5405-5	THORIUM-230	2/17/2014	0.173	Yes	Y		U	U	0.0345	0.0345	pci/l
FB014-20140131	160-5405-5	THORIUM-228	2/17/2014	0.0384	Yes	Y	U		U	0.122	0.122	pci/l
FB015-20140131	160-5405-6	URANIUM	2/14/2014	0.0428	Yes	Y	U		U	0.0959	0.0959	pci/l
FB015-20140131	160-5405-6	URANIUM 233 AND 234	2/14/2014	0.0472	Yes	Y	U		U	0.0830	0.0830	pci/l
FB015-20140131	160-5405-6	URANIUM-235	2/14/2014	0.0641	Yes	Y				0.0641	0.0641	pci/l
FB015-20140131	160-5405-6	THORIUM-230	2/17/2014	0.175	Yes	Y		U	U	0.0399	0.0399	pci/l
FB015-20140131	160-5405-6	THORIUM-228	2/17/2014	0.13	Yes	Y	U		U	0.132	0.132	pci/l
FB015-20140131	160-5405-6	THORIUM	2/17/2014	0.0284	Yes	Y	U		U	0.0636	0.0636	pci/l
LT-R-001-0-5-20140131	160-5405-1	THORIUM	2/19/2014	0.442	Yes	Y				0.0565	0.0565	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-001-0-5-20140131	160-5405-1	THORIUM-228	2/19/2014	0.545	Yes	Y				0.0824	0.0824	pci/g
LT-R-001-0-5-20140131	160-5405-1	THORIUM-230	2/19/2014	0.584	Yes	Y				0.0710	0.0710	pci/g
LT-R-001-0-5-20140131	160-5405-1	URANIUM-235	2/19/2014	-0.000918	Yes	Y	U		U	0.120	0.120	pci/g
LT-R-001-0-5-20140131	160-5405-1	URANIUM 233 AND 234	2/19/2014	0.586	Yes	Y		U	U	0.0613	0.0613	pci/g
LT-R-001-0-5-20140131	160-5405-1	URANIUM	2/19/2014	0.467	Yes	Y		U	U	0.0837	0.0837	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	THORIUM-230	2/19/2014	0.6556	Yes	Y				0.0903	0.0903	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	THORIUM	2/19/2014	0.6586	Yes	Y				0.102	0.102	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	THORIUM-228	2/19/2014	0.8142	Yes	Y				0.105	0.105	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	URANIUM	2/19/2014	0.5087	Yes	Y				0.0311	0.0311	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	URANIUM-235	2/19/2014	0.02104	Yes	Y	U		U	0.0673	0.0673	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	URANIUM 233 AND 234	2/19/2014	0.5208	Yes	Y				0.0673	0.0673	pci/g
LT-R-001-5-10-20140131	160-5405-2	THORIUM-230	2/19/2014	0.663	Yes	Y				0.0807	0.0807	pci/g
LT-R-001-5-10-20140131	160-5405-2	THORIUM	2/19/2014	0.766	Yes	Y				0.0947	0.0947	pci/g
LT-R-001-5-10-20140131	160-5405-2	THORIUM-228	2/19/2014	0.626	Yes	Y				0.102	0.102	pci/g
LT-R-001-5-10-20140131	160-5405-2	URANIUM 233 AND 234	2/19/2014	0.59	Yes	Y		U	U	0.0732	0.0732	pci/g
LT-R-001-5-10-20140131	160-5405-2	URANIUM	2/19/2014	0.684	Yes	Y		U	U	0.0763	0.0763	pci/g
LT-R-001-5-10-20140131	160-5405-2	URANIUM-235	2/19/2014	0.067	Yes	Y				0.0402	0.0402	pci/g
LT-R-001-GW-20140131	160-5405-3	URANIUM	2/14/2014	0.132	Yes	Y				0.0823	0.0823	pci/l
LT-R-001-GW-20140131	160-5405-3	URANIUM 233 AND 234	2/14/2014	0.0554	Yes	Y	U		U	0.105	0.105	pci/l
LT-R-001-GW-20140131	160-5405-3	URANIUM-235	2/14/2014	0.0636	Yes	Y				0.0636	0.0636	pci/l
LT-R-001-GW-20140131	160-5405-3	THORIUM-230	2/17/2014	0.117	Yes	Y		U	U	0.0801	0.0801	pci/l
LT-R-001-GW-20140131	160-5405-3	THORIUM	2/17/2014	0.0324	Yes	Y				0.0324	0.0324	pci/l
LT-R-001-GW-20140131	160-5405-3	THORIUM-228	2/17/2014	0.134	Yes	Y				0.115	0.115	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	URANIUM-235	2/14/2014	0.02066	Yes	Y	U		U	0.0620	0.0620	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	URANIUM	2/14/2014	0.145	Yes	Y				0.0802	0.0802	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-001-GW-20140131LR	160-5405-3LR	URANIUM 233 AND 234	2/14/2014	0.08717	Yes	Y	U		U	0.131	0.131	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	THORIUM-230	2/17/2014	0.2124	Yes	Y				0.0924	0.0924	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	THORIUM-228	2/17/2014	0.1378	Yes	Y				0.136	0.136	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	THORIUM	2/17/2014	0.02963	Yes	Y	U		U	0.0634	0.0634	pci/l
LT-R-002-GW-20140131	160-5405-4	URANIUM 233 AND 234	2/14/2014	3.37	Yes	Y				0.731	0.731	pci/l
LT-R-002-GW-20140131	160-5405-4	URANIUM-235	2/14/2014	0.096	Yes	Y	U		U	0.619	0.619	pci/l
LT-R-002-GW-20140131	160-5405-4	URANIUM	2/14/2014	6.06	Yes	Y				0.308	0.308	pci/l
LT-R-002-GW-20140131	160-5405-4	THORIUM-228	2/17/2014	4.22	Yes	Y				0.910	0.910	pci/l
LT-R-002-GW-20140131	160-5405-4	THORIUM-230	2/17/2014	7.79	Yes	Y				0.437	0.437	pci/l
LT-R-002-GW-20140131	160-5405-4	THORIUM	2/17/2014	4.69	Yes	Y				0.198	0.198	pci/l
LT-R-003-GW-20140131	160-5405-7	URANIUM-235	2/14/2014	0.178	Yes	Y				0.134	0.134	pci/l
LT-R-003-GW-20140131	160-5405-7	URANIUM 233 AND 234	2/14/2014	0.358	Yes	Y				0.107	0.107	pci/l
LT-R-003-GW-20140131	160-5405-7	URANIUM	2/14/2014	0.669	Yes	Y				0.173	0.173	pci/l
LT-R-003-GW-20140131	160-5405-7	THORIUM-230	2/18/2014	4.16	Yes	Y				0.0678	0.0678	pci/l
LT-R-003-GW-20140131	160-5405-7	THORIUM	2/18/2014	2.18	Yes	Y				0.0674	0.0674	pci/l
LT-R-003-GW-20140131	160-5405-7	THORIUM-228	2/18/2014	2.57	Yes	Y				0.289	0.289	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601034951A	1601034951A	ACTINIUM 228	2/6/2014	9.184	Yes	Y	U		U	14.8	14.8	pci/l
1601034951A	1601034951A	AMERICIUM-241	2/6/2014	2.615	Yes	Y	U		U	4.51	4.51	pci/l
1601034951A	1601034951A	BISMUTH-212	2/6/2014	21.48	Yes	Y	U		U	55.2	55.2	pci/l
1601034951A	1601034951A	BISMUTH-214	2/6/2014	-10.78	Yes	Y	U		U	12.7	12.7	pci/l
1601034951A	1601034951A	COBALT-60	2/6/2014	-0.03265	Yes	Y	U		U	5.78	5.78	pci/l
1601034951A	1601034951A	POTASSIUM-40	2/6/2014	-69.51	Yes	Y	U		U	84.7	84.7	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601034951A	1601034951A	CESIUM-137	2/6/2014	1.671	Yes	Y	U		U	4.83	4.83	pci/l
1601034951A	1601034951A	LEAD-214	2/6/2014	4.702	Yes	Y	U		U	8.56	8.56	pci/l
1601034951A	1601034951A	PROTACTINIUM 231	2/6/2014	6.181	Yes	Y	U		U	114	114	pci/l
1601034951A	1601034951A	Protactinium 234	2/6/2014	65.89	Yes	Y	U		U	604	604	pci/l
1601034951A	1601034951A	LEAD-212	2/6/2014	2.013	Yes	Y	U		U	7.22	7.22	pci/l
1601044951A	1601044951A	ACTINIUM 228	2/13/2014	0.008652	Yes	Y	U		U	0.0143	0.0143	pci/g
1601044951A	1601044951A	RADIUM-226	2/13/2014	0.02563	Yes	Y	U		U	0.0880	0.0880	pci/g
1601044951A	1601044951A	Protactinium 234	2/13/2014	-0.2368	Yes	Y	U		U	0.710	0.710	pci/g
1601044951A	1601044951A	PROTACTINIUM 231	2/13/2014	0.02156	Yes	Y	U		U	0.0854	0.0854	pci/g
1601044951A	1601044951A	POTASSIUM-40	2/13/2014	-0.0747	Yes	Y	U		U	0.0927	0.0927	pci/g
1601044951A	1601044951A	LEAD-212	2/13/2014	0.004461	Yes	Y	U		U	0.00652	0.00652	pci/g
1601044951A	1601044951A	LEAD-210	2/13/2014	0.01332	Yes	Y	U		U	0.0836	0.0836	pci/g
1601044951A	1601044951A	COBALT-60	2/13/2014	0.001507	Yes	Y	U		U	0.00566	0.00566	pci/g
1601044951A	1601044951A	CESIUM-137	2/13/2014	0.001752	Yes	Y	U		U	0.00495	0.00495	pci/g
1601044951A	1601044951A	BISMUTH-214	2/13/2014	-0.001624	Yes	Y	U		U	0.0120	0.0120	pci/g
1601044951A	1601044951A	AMERICIUM-241	2/13/2014	-0.0006093	Yes	Y	U		U	0.00660	0.00660	pci/g
1601044951A	1601044951A	LEAD-214	2/13/2014	0.01292	Yes	Y				0.00634	0.00634	pci/g
1601044951A	1601044951A	RADIUM-228	2/13/2014	0.008652	Yes	Y	U		U	0.0143	0.0143	pci/g
1601044951A	1601044951A	THALLIUM-208	2/13/2014	0.002789	Yes	Y	U		U	0.00421	0.00421	pci/g
1601044951A	1601044951A	THORIUM-234	2/13/2014	0.01201	Yes	Y	U		U	0.0782	0.0782	pci/g
1601044951A	1601044951A	URANIUM	2/13/2014	0.01201	Yes	Y	U		U	0.0782	0.0782	pci/g
1601044951A	1601044951A	URANIUM-235	2/13/2014	0.008551	Yes	Y	U		U	0.0172	0.0172	pci/g
1601044951A	1601044951A	BISMUTH-212	2/13/2014	0.001881	Yes	Y	U		U	0.0472	0.0472	pci/g
FB014-20140131	160-5405-5	ACTINIUM 228	2/6/2014	18.2	Yes	Y				9.69	9.69	pci/l
FB014-20140131	160-5405-5	Protactinium 234	2/6/2014	364	Yes	Y	U		U	474	474	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
FB014-20140131	160-5405-5	PROTACTINIUM 231	2/6/2014	-38.4	Yes	Y	U		U	116	116	pci/l
FB014-20140131	160-5405-5	POTASSIUM-40	2/6/2014	18	Yes	Y	U		U	59.0	59.0	pci/l
FB014-20140131	160-5405-5	LEAD-214	2/6/2014	-4.49	Yes	Y	U		U	10.6	10.6	pci/l
FB014-20140131	160-5405-5	LEAD-212	2/6/2014	-1.53	Yes	Y	U		U	7.40	7.40	pci/l
FB014-20140131	160-5405-5	CESIUM-137	2/6/2014	0.0458	Yes	Y	U		U	3.16	3.16	pci/l
FB014-20140131	160-5405-5	BISMUTH-212	2/6/2014	17.5	Yes	Y	U		U	47.9	47.9	pci/l
FB014-20140131	160-5405-5	BISMUTH-214	2/6/2014	5.9	Yes	Y	U		U	10.8	10.8	pci/l
FB015-20140131	160-5405-6	PROTACTINIUM 231	2/6/2014	-45.8	Yes	Y	U		U	127	127	pci/l
FB015-20140131	160-5405-6	LEAD-214	2/6/2014	-0.0129	Yes	Y	U		U	12.3	12.3	pci/l
FB015-20140131	160-5405-6	ACTINIUM 228	2/6/2014	8.54	Yes	Y	U		U	16.7	16.7	pci/l
FB015-20140131	160-5405-6	BISMUTH-212	2/6/2014	28.6	Yes	Y	U		U	54.5	54.5	pci/l
FB015-20140131	160-5405-6	BISMUTH-214	2/6/2014	4.03	Yes	Y	U		U	12.1	12.1	pci/l
FB015-20140131	160-5405-6	CESIUM-137	2/6/2014	1.51	Yes	Y	U		U	3.87	3.87	pci/l
FB015-20140131	160-5405-6	LEAD-212	2/6/2014	7.62	Yes	Y	U		U	9.90	9.90	pci/l
FB015-20140131	160-5405-6	Protactinium 234	2/6/2014	-286	Yes	Y	U		U	765	765	pci/l
FB015-20140131	160-5405-6	POTASSIUM-40	2/6/2014	-76.9	Yes	Y	U		U	92.1	92.1	pci/l
LT-R-001-0-5-20140131	160-5405-1	BISMUTH-212	2/13/2014	0.935	Yes	Y				0.0958	0.0958	pci/g
LT-R-001-0-5-20140131	160-5405-1	URANIUM-235	2/13/2014	0.0628	Yes	Y				0.0438	0.0438	pci/g
LT-R-001-0-5-20140131	160-5405-1	URANIUM	2/13/2014	0.914	Yes	Y				0.197	0.197	pci/g
LT-R-001-0-5-20140131	160-5405-1	THORIUM-234	2/13/2014	0.914	Yes	Y				0.197	0.197	pci/g
LT-R-001-0-5-20140131	160-5405-1	THALLIUM-208	2/13/2014	0.268	Yes	Y				0.00967	0.00967	pci/g
LT-R-001-0-5-20140131	160-5405-1	RADIUM-228	2/13/2014	0.832	Yes	Y				0.0292	0.0292	pci/g
LT-R-001-0-5-20140131	160-5405-1	ACTINIUM 228	2/13/2014	0.832	Yes	Y				0.0292	0.0292	pci/g
LT-R-001-0-5-20140131	160-5405-1	LEAD-214	2/13/2014	0.787	Yes	Y				0.0173	0.0173	pci/g
LT-R-001-0-5-20140131	160-5405-1	BISMUTH-214	2/13/2014	0.716	Yes	Y				0.0163	0.0163	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-001-0-5-20140131	160-5405-1	LEAD-210	2/13/2014	0.759	Yes	Y				0.196	0.196	pci/g
LT-R-001-0-5-20140131	160-5405-1	LEAD-212	2/13/2014	0.892	Yes	Y				0.0132	0.0132	pci/g
LT-R-001-0-5-20140131	160-5405-1	Protactinium 234	2/13/2014	1.05	Yes	Y	U		U	1.15	1.15	pci/g
LT-R-001-0-5-20140131	160-5405-1	PROTACTINIUM 231	2/13/2014	-0.351	Yes	Y	U		U	0.261	0.261	pci/g
LT-R-001-0-5-20140131	160-5405-1	POTASSIUM-40	2/13/2014	10.4	Yes	Y				0.0866	0.0866	pci/g
LT-R-001-0-5-20140131	160-5405-1	RADIUM-226	2/13/2014	1.59	Yes	Y				0.179	0.179	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	CESIUM-137	2/14/2014	-0.002527	Yes	Y	U		U	0.00796	0.00796	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	COBALT-60	2/14/2014	0.001165	Yes	Y	U		U	0.00922	0.00922	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	ACTINIUM 228	2/14/2014	0.8058	Yes	Y				0.0316	0.0316	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	AMERICIUM-241	2/14/2014	-0.002041	Yes	Y	U		U	0.0240	0.0240	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	BISMUTH-212	2/14/2014	0.858	Yes	Y				0.0883	0.0883	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	BISMUTH-214	2/14/2014	0.7104	Yes	Y				0.0184	0.0184	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	URANIUM-235	2/14/2014	0.05683	Yes	Y				0.0417	0.0417	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	PROTACTINIUM 231	2/14/2014	-0.3301	Yes	Y	U		U	0.251	0.251	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	THORIUM-234	2/14/2014	0.797	Yes	Y				0.199	0.199	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	LEAD-210	2/14/2014	0.8262	Yes	Y				0.184	0.184	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	LEAD-212	2/14/2014	0.8117	Yes	Y				0.0169	0.0169	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	THALLIUM-208	2/14/2014	0.2702	Yes	Y				0.00911	0.00911	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	RADIUM-228	2/14/2014	0.8058	Yes	Y				0.0316	0.0316	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	RADIUM-226	2/14/2014	1.663	Yes	Y				0.191	0.191	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	Protactinium 234	2/14/2014	1.692	Yes	Y				0.842	0.842	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	URANIUM	2/14/2014	0.797	Yes	Y				0.199	0.199	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	LEAD-214	2/14/2014	0.8042	Yes	Y				0.0186	0.0186	pci/g
LT-R-001-0-5-20140131LR	160-5405-1LR	POTASSIUM-40	2/14/2014	10.9	Yes	Y				0.0953	0.0953	pci/g
LT-R-001-5-10-20140131	160-5405-2	ACTINIUM 228	2/13/2014	0.991	Yes	Y				0.0354	0.0354	pci/g

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-001-5-10-20140131	160-5405-2	BISMUTH-212	2/13/2014	0.956	Yes	Y				0.115	0.115	pci/g
LT-R-001-5-10-20140131	160-5405-2	BISMUTH-214	2/13/2014	0.76	Yes	Y				0.0219	0.0219	pci/g
LT-R-001-5-10-20140131	160-5405-2	LEAD-214	2/13/2014	0.858	Yes	Y				0.0222	0.0222	pci/g
LT-R-001-5-10-20140131	160-5405-2	LEAD-212	2/13/2014	0.945	Yes	Y				0.0194	0.0194	pci/g
LT-R-001-5-10-20140131	160-5405-2	Protactinium 234	2/13/2014	2.59	Yes	Y				1.15	1.15	pci/g
LT-R-001-5-10-20140131	160-5405-2	POTASSIUM-40	2/13/2014	18	Yes	Y				0.127	0.127	pci/g
LT-R-001-5-10-20140131	160-5405-2	LEAD-210	2/13/2014	0.937	Yes	Y				0.230	0.230	pci/g
LT-R-001-5-10-20140131	160-5405-2	URANIUM	2/13/2014	0.888	Yes	Y				0.235	0.235	pci/g
LT-R-001-5-10-20140131	160-5405-2	THORIUM-234	2/13/2014	0.888	Yes	Y				0.235	0.235	pci/g
LT-R-001-5-10-20140131	160-5405-2	THALLIUM-208	2/13/2014	0.316	Yes	Y				0.0105	0.0105	pci/g
LT-R-001-5-10-20140131	160-5405-2	PROTACTINIUM 231	2/13/2014	-0.264	Yes	Y	U		U	0.293	0.293	pci/g
LT-R-001-5-10-20140131	160-5405-2	RADIUM-228	2/13/2014	0.991	Yes	Y				0.0354	0.0354	pci/g
LT-R-001-5-10-20140131	160-5405-2	RADIUM-226	2/13/2014	1.87	Yes	Y				0.218	0.218	pci/g
LT-R-001-5-10-20140131	160-5405-2	URANIUM-235	2/13/2014	0.0883	Yes	Y				0.0483	0.0483	pci/g
LT-R-001-GW-20140131	160-5405-3	LEAD-214	2/6/2014	56.1	Yes	Y				10.4	10.4	pci/l
LT-R-001-GW-20140131	160-5405-3	POTASSIUM-40	2/6/2014	13	Yes	Y	U		U	75.7	75.7	pci/l
LT-R-001-GW-20140131	160-5405-3	CESIUM-137	2/6/2014	-2.31	Yes	Y	U		U	5.43	5.43	pci/l
LT-R-001-GW-20140131	160-5405-3	LEAD-212	2/6/2014	0.146	Yes	Y	U		U	7.88	7.88	pci/l
LT-R-001-GW-20140131	160-5405-3	PROTACTINIUM 231	2/6/2014	-33.8	Yes	Y	U		U	120	120	pci/l
LT-R-001-GW-20140131	160-5405-3	BISMUTH-212	2/6/2014	12.1	Yes	Y	U		U	47.6	47.6	pci/l
LT-R-001-GW-20140131	160-5405-3	BISMUTH-214	2/6/2014	57.4	Yes	Y				11.3	11.3	pci/l
LT-R-001-GW-20140131	160-5405-3	Protactinium 234	2/6/2014	-2.43	Yes	Y	U		U	508	508	pci/l
LT-R-001-GW-20140131	160-5405-3	ACTINIUM 228	2/6/2014	12.1	Yes	Y	U		U	12.5	12.5	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	POTASSIUM-40	2/7/2014	-75.4	Yes	Y	U		U	78.3	78.3	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	PROTACTINIUM 231	2/7/2014	11.07	Yes	Y	U		U	138	138	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-001-GW-20140131LR	160-5405-3LR	Protactinium 234	2/7/2014	247.7	Yes	Y	U		U	469	469	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	ACTINIUM 228	2/7/2014	-1.236	Yes	Y	U		U	17.4	17.4	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	CESIUM-137	2/7/2014	0.03227	Yes	Y	U		U	4.75	4.75	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	LEAD-212	2/7/2014	1.186	Yes	Y	U		U	8.08	8.08	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	LEAD-214	2/7/2014	45.59	Yes	Y				10.5	10.5	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	BISMUTH-214	2/7/2014	36.35	Yes	Y				11.7	11.7	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	AMERICIUM-241	2/7/2014	-0.4542	Yes	Y	U		U	9.30	9.30	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	COBALT-60	2/7/2014	0.7588	Yes	Y	U		U	4.56	4.56	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	BISMUTH-212	2/7/2014	-16.51	Yes	Y	U		U	56.9	56.9	pci/l
LT-R-002-GW-20140131	160-5405-4	BISMUTH-214	2/6/2014	21.7	Yes	Y				9.93	9.93	pci/l
LT-R-002-GW-20140131	160-5405-4	CESIUM-137	2/6/2014	1.49	Yes	Y	U		U	3.88	3.88	pci/l
LT-R-002-GW-20140131	160-5405-4	BISMUTH-212	2/6/2014	25.2	Yes	Y	U		U	47.0	47.0	pci/l
LT-R-002-GW-20140131	160-5405-4	LEAD-212	2/6/2014	11	Yes	Y				7.83	7.83	pci/l
LT-R-002-GW-20140131	160-5405-4	Protactinium 234	2/6/2014	-362	Yes	Y	U		U	554	554	pci/l
LT-R-002-GW-20140131	160-5405-4	PROTACTINIUM 231	2/6/2014	-14.8	Yes	Y	U		U	109	109	pci/l
LT-R-002-GW-20140131	160-5405-4	POTASSIUM-40	2/6/2014	88.4	Yes	Y				51.0	51.0	pci/l
LT-R-002-GW-20140131	160-5405-4	LEAD-214	2/6/2014	34.2	Yes	Y				9.81	9.81	pci/l
LT-R-002-GW-20140131	160-5405-4	ACTINIUM 228	2/6/2014	27.2	Yes	Y				13.4	13.4	pci/l
LT-R-003-GW-20140131	160-5405-7	Protactinium 234	2/6/2014	38	Yes	Y	U		U	596	596	pci/l
LT-R-003-GW-20140131	160-5405-7	PROTACTINIUM 231	2/6/2014	7.28	Yes	Y	U		U	95.7	95.7	pci/l
LT-R-003-GW-20140131	160-5405-7	POTASSIUM-40	2/6/2014	3.3	Yes	Y	U		U	60.2	60.2	pci/l
LT-R-003-GW-20140131	160-5405-7	ACTINIUM 228	2/6/2014	7.82	Yes	Y	U		U	14.7	14.7	pci/l
LT-R-003-GW-20140131	160-5405-7	LEAD-212	2/6/2014	2.98	Yes	Y	U		U	7.36	7.36	pci/l
LT-R-003-GW-20140131	160-5405-7	BISMUTH-212	2/6/2014	15.9	Yes	Y	U		U	42.4	42.4	pci/l
LT-R-003-GW-20140131	160-5405-7	BISMUTH-214	2/6/2014	64.7	Yes	Y				7.97	7.97	pci/l

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Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-003-GW-20140131	160-5405-7	CESIUM-137	2/6/2014	0.0798	Yes	Y	U		U	4.27	4.27	pci/l
LT-R-003-GW-20140131	160-5405-7	LEAD-214	2/6/2014	71.2	Yes	Y				10.4	10.4	pci/l

Analytical Method E903.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601034751A	1601034751A	RADIUM-226	2/11/2014	0.06645	Yes	Y	U		U	0.158	0.158	pci/l
FB014-20140131	160-5405-5	RADIUM-226	2/11/2014	0.0875	Yes	Y	U		U	0.155	0.155	pci/l
FB014-20140131LR	160-5405-5LR	RADIUM-226	2/11/2014	0.1224	Yes	Y	U		U	0.149	0.149	pci/l
FB015-20140131	160-5405-6	RADIUM-226	2/11/2014	0.0567	Yes	Y	U		U	0.147	0.147	pci/l
LT-R-001-GW-20140131	160-5405-3	RADIUM-226	2/11/2014	0.426	Yes	Y				0.136	0.136	pci/l
LT-R-002-GW-20140131	160-5405-4	RADIUM-226	2/11/2014	7.4	Yes	Y				0.283	0.283	pci/l
LT-R-003-GW-20140131	160-5405-7	RADIUM-226	2/12/2014	3.53	Yes	Y				0.125	0.125	pci/l

Analytical Method E904.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601033121A	1601033121A	RADIUM-228	2/10/2014	-0.05795	Yes	Y	U		U	0.300	0.300	pci/l
FB014-20140131	160-5405-5	RADIUM-228	2/10/2014	0.217	Yes	Y	U		U	0.387	0.387	pci/l
FB015-20140131	160-5405-6	RADIUM-228	2/10/2014	0.00759	Yes	Y	U		U	0.333	0.333	pci/l
LT-R-001-GW-20140131	160-5405-3	RADIUM-228	2/10/2014	0.535	Yes	Y				0.364	0.364	pci/l
LT-R-001-GW-20140131LR	160-5405-3LR	RADIUM-228	2/10/2014	0.1935	Yes	Y	U		U	0.359	0.359	pci/l
LT-R-002-GW-20140131	160-5405-4	RADIUM-228	2/10/2014	3.07	Yes	Y				0.730	0.730	pci/l
LT-R-003-GW-20140131	160-5405-7	RADIUM-228	2/10/2014	1.8	Yes	Y				0.369	0.369	pci/l

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Analytical Method E903.0

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601127391A	1601127391A	RADIUM-226	3/30/2014	0.05449	Yes	Y	U		U	0.0633	0.0633	pci/l
LT-R-002-GW-20140131	160-5405-4	RADIUM-226	3/30/2014	1.27	Yes	Y				0.152	0.152	pci/l
LT-R-003-GW-20140131	160-5405-7	RADIUM-226	3/30/2014	0.852	Yes	Y				0.0628	0.0628	pci/l

Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601051031A	1601051031A	THORIUM-230	2/20/2014	0.07563	Yes	Y	U		U	0.100	0.100	pci/g
1601051031A	1601051031A	THORIUM	2/20/2014	-0.009951	Yes	Y	U		U	0.0687	0.0687	pci/g
1601051031A	1601051031A	THORIUM-228	2/20/2014	0.05264	Yes	Y	U		U	0.0869	0.0869	pci/g
1601051051A	1601051051A	URANIUM 233 AND 234	2/20/2014	0.02747	Yes	Y	U		U	0.0726	0.0726	pci/g
1601051051A	1601051051A	URANIUM-235	2/20/2014	0.01351	Yes	Y	U		U	0.0823	0.0823	pci/g
1601051051A	1601051051A	URANIUM	2/20/2014	0.02359	Yes	Y	U		U	0.0781	0.0781	pci/g
LT-G-019-8-10-20140206	160-5481-1	THORIUM-230	2/20/2014	0.268	Yes	Y				0.115	0.115	pci/g
LT-G-019-8-10-20140206	160-5481-1	THORIUM-228	2/20/2014	0.352	Yes	Y				0.124	0.124	pci/g
LT-G-019-8-10-20140206	160-5481-1	THORIUM	2/20/2014	0.205	Yes	Y				0.0802	0.0802	pci/g
LT-G-019-8-10-20140206	160-5481-1	URANIUM 233 AND 234	2/20/2014	0.27	Yes	Y				0.0696	0.0696	pci/g
LT-G-019-8-10-20140206	160-5481-1	URANIUM-235	2/20/2014	-0.00251	Yes	Y	U		U	0.0610	0.0610	pci/g
LT-G-019-8-10-20140206	160-5481-1	URANIUM	2/20/2014	0.2	Yes	Y				0.0558	0.0558	pci/g
LT-G-019-8-10-20140206LR	160-5481-1LR	THORIUM-228	2/20/2014	0.3423	Yes	Y				0.111	0.111	pci/g
LT-G-019-8-10-20140206LR	160-5481-1LR	THORIUM	2/20/2014	0.2574	Yes	Y				0.0830	0.0830	pci/g
LT-G-019-8-10-20140206LR	160-5481-1LR	THORIUM-230	2/20/2014	0.4452	Yes	Y				0.0953	0.0953	pci/g
LT-G-019-8-10-20140206LR	160-5481-1LR	URANIUM	2/20/2014	0.3431	Yes	Y				0.0645	0.0645	pci/g
LT-G-019-8-10-20140206LR	160-5481-1LR	URANIUM 233 AND 234	2/20/2014	0.3515	Yes	Y				0.0760	0.0760	pci/g
LT-G-019-8-10-20140206LR	160-5481-1LR	URANIUM-235	2/20/2014	0	Yes	Y	U		U	0.0465	0.0465	pci/g

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601044951A	1601044951A	LEAD-210	2/13/2014	0.01332	Yes	Y	U		U	0.0836	0.0836	pci/g
1601044951A	1601044951A	Protactinium 234	2/13/2014	-0.2368	Yes	Y	U		U	0.710	0.710	pci/g
1601044951A	1601044951A	PROTACTINIUM 231	2/13/2014	0.02156	Yes	Y	U		U	0.0854	0.0854	pci/g
1601044951A	1601044951A	RADIUM-228	2/13/2014	0.008652	Yes	Y	U		U	0.0143	0.0143	pci/g

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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601044951A	1601044951A	THALLIUM-208	2/13/2014	0.002789	Yes	Y	U		U	0.00421	0.00421	pci/g
1601044951A	1601044951A	AMERICIUM-241	2/13/2014	-0.0006093	Yes	Y	U		U	0.00660	0.00660	pci/g
1601044951A	1601044951A	ACTINIUM 228	2/13/2014	0.008652	Yes	Y	U		U	0.0143	0.0143	pci/g
1601044951A	1601044951A	RADIUM-226	2/13/2014	0.02563	Yes	Y	U		U	0.0880	0.0880	pci/g
1601044951A	1601044951A	CESIUM-137	2/13/2014	0.001752	Yes	Y	U		U	0.00495	0.00495	pci/g
1601044951A	1601044951A	THORIUM-234	2/13/2014	0.01201	Yes	Y	U		U	0.0782	0.0782	pci/g
1601044951A	1601044951A	LEAD-212	2/13/2014	0.004461	Yes	Y	U		U	0.00652	0.00652	pci/g
1601044951A	1601044951A	LEAD-214	2/13/2014	0.01292	Yes	Y				0.00634	0.00634	pci/g
1601044951A	1601044951A	COBALT-60	2/13/2014	0.001507	Yes	Y	U		U	0.00566	0.00566	pci/g
1601044951A	1601044951A	URANIUM	2/13/2014	0.01201	Yes	Y	U		U	0.0782	0.0782	pci/g
1601044951A	1601044951A	BISMUTH-212	2/13/2014	0.001881	Yes	Y	U		U	0.0472	0.0472	pci/g
1601044951A	1601044951A	POTASSIUM-40	2/13/2014	-0.0747	Yes	Y	U		U	0.0927	0.0927	pci/g
1601044951A	1601044951A	BISMUTH-214	2/13/2014	-0.001624	Yes	Y	U		U	0.0120	0.0120	pci/g
1601044951A	1601044951A	URANIUM-235	2/13/2014	0.008551	Yes	Y	U		U	0.0172	0.0172	pci/g
LT-G-019-8-10-20140206	160-5481-1	RADIUM-228	2/14/2014	0.349	Yes	Y				0.0226	0.0226	pci/g
LT-G-019-8-10-20140206	160-5481-1	URANIUM	2/14/2014	0.347	Yes	Y				0.130	0.130	pci/g
LT-G-019-8-10-20140206	160-5481-1	ACTINIUM 228	2/14/2014	0.349	Yes	Y				0.0226	0.0226	pci/g
LT-G-019-8-10-20140206	160-5481-1	BISMUTH-212	2/14/2014	0.424	Yes	Y				0.0738	0.0738	pci/g
LT-G-019-8-10-20140206	160-5481-1	BISMUTH-214	2/14/2014	0.294	Yes	Y				0.0117	0.0117	pci/g
LT-G-019-8-10-20140206	160-5481-1	LEAD-210	2/14/2014	0.242	Yes	Y				0.117	0.117	pci/g
LT-G-019-8-10-20140206	160-5481-1	LEAD-212	2/14/2014	0.353	Yes	Y				0.00832	0.00832	pci/g
LT-G-019-8-10-20140206	160-5481-1	LEAD-214	2/14/2014	0.325	Yes	Y				0.0125	0.0125	pci/g
LT-G-019-8-10-20140206	160-5481-1	POTASSIUM-40	2/14/2014	10	Yes	Y				0.0643	0.0643	pci/g
LT-G-019-8-10-20140206	160-5481-1	PROTACTINIUM 231	2/14/2014	-0.184	Yes	Y	U		U	0.169	0.169	pci/g
LT-G-019-8-10-20140206	160-5481-1	Protactinium 234	2/14/2014	0.626	Yes	Y	U		U	0.842	0.842	pci/g

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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-G-019-8-10-20140206	160-5481-1	RADIUM-226	2/14/2014	0.749	Yes	Y				0.119	0.119	pci/g
LT-G-019-8-10-20140206	160-5481-1	THORIUM-234	2/14/2014	0.347	Yes	Y				0.130	0.130	pci/g
LT-G-019-8-10-20140206	160-5481-1	THALLIUM-208	2/14/2014	0.102	Yes	Y				0.00526	0.00526	pci/g
LT-G-019-8-10-20140206	160-5481-1	URANIUM-235	2/14/2014	0.0433	Yes	Y				0.0287	0.0287	pci/g

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Analytical Method A-01-R

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601051031A	1601051031A	THORIUM-230	2/20/2014	0.07563	Yes	Y	U		U	0.100	0.100	pci/g
1601051031A	1601051031A	THORIUM-228	2/20/2014	0.05264	Yes	Y	U		U	0.0869	0.0869	pci/g
1601051031A	1601051031A	THORIUM	2/20/2014	-0.009951	Yes	Y	U		U	0.0687	0.0687	pci/g
1601051051A	1601051051A	URANIUM	2/20/2014	0.02359	Yes	Y	U		U	0.0781	0.0781	pci/g
1601051051A	1601051051A	URANIUM-235	2/20/2014	0.01351	Yes	Y	U		U	0.0823	0.0823	pci/g
1601051051A	1601051051A	URANIUM 233 AND 234	2/20/2014	0.02747	Yes	Y	U		U	0.0726	0.0726	pci/g
LT-R-002-0-5-20140131	160-5485-1	THORIUM	2/20/2014	0.375	Yes	Y				0.0518	0.0518	pci/g
LT-R-002-0-5-20140131	160-5485-1	THORIUM-228	2/20/2014	0.415	Yes	Y				0.0979	0.0979	pci/g
LT-R-002-0-5-20140131	160-5485-1	THORIUM-230	2/20/2014	0.485	Yes	Y				0.0759	0.0759	pci/g
LT-R-002-0-5-20140131	160-5485-1	URANIUM-235	2/20/2014	0.00851	Yes	Y	U		U	0.0708	0.0708	pci/g
LT-R-002-0-5-20140131	160-5485-1	URANIUM 233 AND 234	2/20/2014	0.362	Yes	Y				0.0708	0.0708	pci/g
LT-R-002-0-5-20140131	160-5485-1	URANIUM	2/20/2014	0.451	Yes	Y				0.0667	0.0667	pci/g
LT-R-002-5-10-20140131	160-5485-2	THORIUM-230	2/20/2014	0.856	Yes	Y				0.0768	0.0768	pci/g
LT-R-002-5-10-20140131	160-5485-2	THORIUM	2/20/2014	0.489	Yes	Y				0.0610	0.0610	pci/g
LT-R-002-5-10-20140131	160-5485-2	THORIUM-228	2/20/2014	0.475	Yes	Y				0.0890	0.0890	pci/g
LT-R-002-5-10-20140131	160-5485-2	URANIUM	2/20/2014	0.399	Yes	Y				0.0582	0.0582	pci/g
LT-R-002-5-10-20140131	160-5485-2	URANIUM 233 AND 234	2/20/2014	0.411	Yes	Y				0.0583	0.0583	pci/g
LT-R-002-5-10-20140131	160-5485-2	URANIUM-235	2/20/2014	0.0227	Yes	Y	U		U	0.0725	0.0725	pci/g
LT-R-003-5-10-20140131	160-5485-3	THORIUM-230	2/20/2014	0.777	Yes	Y				0.0893	0.0893	pci/g
LT-R-003-5-10-20140131	160-5485-3	THORIUM-228	2/20/2014	0.486	Yes	Y				0.0963	0.0963	pci/g
LT-R-003-5-10-20140131	160-5485-3	THORIUM	2/20/2014	0.322	Yes	Y				0.0937	0.0937	pci/g
LT-R-003-5-10-20140131	160-5485-3	URANIUM-235	2/20/2014	0.0183	Yes	Y	U		U	0.0895	0.0895	pci/g
LT-R-003-5-10-20140131	160-5485-3	URANIUM 233 AND 234	2/20/2014	0.39	Yes	Y				0.0763	0.0763	pci/g
LT-R-003-5-10-20140131	160-5485-3	URANIUM	2/20/2014	0.276	Yes	Y				0.0669	0.0669	pci/g

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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
1601044951A	1601044951A	URANIUM-235	2/13/2014	0.008551	Yes	Y	U		U	0.0172	0.0172	pci/g
1601044951A	1601044951A	BISMUTH-212	2/13/2014	0.001881	Yes	Y	U		U	0.0472	0.0472	pci/g
1601044951A	1601044951A	THORIUM-234	2/13/2014	0.01201	Yes	Y	U		U	0.0782	0.0782	pci/g
1601044951A	1601044951A	AMERICIUM-241	2/13/2014	-0.0006093	Yes	Y	U		U	0.00660	0.00660	pci/g
1601044951A	1601044951A	ACTINIUM 228	2/13/2014	0.008652	Yes	Y	U		U	0.0143	0.0143	pci/g
1601044951A	1601044951A	POTASSIUM-40	2/13/2014	-0.0747	Yes	Y	U		U	0.0927	0.0927	pci/g
1601044951A	1601044951A	PROTACTINIUM 231	2/13/2014	0.02156	Yes	Y	U		U	0.0854	0.0854	pci/g
1601044951A	1601044951A	Protactinium 234	2/13/2014	-0.2368	Yes	Y	U		U	0.710	0.710	pci/g
1601044951A	1601044951A	RADIUM-226	2/13/2014	0.02563	Yes	Y	U		U	0.0880	0.0880	pci/g
1601044951A	1601044951A	THALLIUM-208	2/13/2014	0.002789	Yes	Y	U		U	0.00421	0.00421	pci/g
1601044951A	1601044951A	URANIUM	2/13/2014	0.01201	Yes	Y	U		U	0.0782	0.0782	pci/g
1601044951A	1601044951A	BISMUTH-214	2/13/2014	-0.001624	Yes	Y	U		U	0.0120	0.0120	pci/g
1601044951A	1601044951A	CESIUM-137	2/13/2014	0.001752	Yes	Y	U		U	0.00495	0.00495	pci/g
1601044951A	1601044951A	COBALT-60	2/13/2014	0.001507	Yes	Y	U		U	0.00566	0.00566	pci/g
1601044951A	1601044951A	LEAD-210	2/13/2014	0.01332	Yes	Y	U		U	0.0836	0.0836	pci/g
1601044951A	1601044951A	LEAD-212	2/13/2014	0.004461	Yes	Y	U		U	0.00652	0.00652	pci/g
1601044951A	1601044951A	LEAD-214	2/13/2014	0.01292	Yes	Y				0.00634	0.00634	pci/g
1601044951A	1601044951A	RADIUM-228	2/13/2014	0.008652	Yes	Y	U		U	0.0143	0.0143	pci/g
LT-R-002-0-5-20140131	160-5485-1	LEAD-214	2/13/2014	0.386	Yes	Y				0.0139	0.0139	pci/g
LT-R-002-0-5-20140131	160-5485-1	ACTINIUM 228	2/13/2014	0.605	Yes	Y				0.0233	0.0233	pci/g
LT-R-002-0-5-20140131	160-5485-1	BISMUTH-212	2/13/2014	0.624	Yes	Y				0.0815	0.0815	pci/g
LT-R-002-0-5-20140131	160-5485-1	BISMUTH-214	2/13/2014	0.35	Yes	Y				0.0139	0.0139	pci/g
LT-R-002-0-5-20140131	160-5485-1	LEAD-212	2/13/2014	0.611	Yes	Y				0.0106	0.0106	pci/g
LT-R-002-0-5-20140131	160-5485-1	POTASSIUM-40	2/13/2014	8.63	Yes	Y				0.0638	0.0638	pci/g
LT-R-002-0-5-20140131	160-5485-1	PROTACTINIUM 231	2/13/2014	-0.289	Yes	Y	U		U	0.214	0.214	pci/g

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Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-002-0-5-20140131	160-5485-1	Protactinium 234	2/13/2014	1.08	Yes	Y				0.705	0.705	pci/g
LT-R-002-0-5-20140131	160-5485-1	RADIUM-226	2/13/2014	1.13	Yes	Y				0.137	0.137	pci/g
LT-R-002-0-5-20140131	160-5485-1	RADIUM-228	2/13/2014	0.605	Yes	Y				0.0233	0.0233	pci/g
LT-R-002-0-5-20140131	160-5485-1	THALLIUM-208	2/13/2014	0.201	Yes	Y				0.00736	0.00736	pci/g
LT-R-002-0-5-20140131	160-5485-1	THORIUM-234	2/13/2014	0.525	Yes	Y				0.153	0.153	pci/g
LT-R-002-0-5-20140131	160-5485-1	URANIUM	2/13/2014	0.525	Yes	Y				0.153	0.153	pci/g
LT-R-002-0-5-20140131	160-5485-1	URANIUM-235	2/13/2014	0.0461	Yes	Y				0.0338	0.0338	pci/g
LT-R-002-0-5-20140131	160-5485-1	LEAD-210	2/13/2014	0.341	Yes	Y				0.137	0.137	pci/g
LT-R-002-5-10-20140131	160-5485-2	URANIUM	2/13/2014	0.503	Yes	Y				0.189	0.189	pci/g
LT-R-002-5-10-20140131	160-5485-2	RADIUM-228	2/13/2014	0.599	Yes	Y				0.0241	0.0241	pci/g
LT-R-002-5-10-20140131	160-5485-2	RADIUM-226	2/13/2014	1.03	Yes	Y				0.173	0.173	pci/g
LT-R-002-5-10-20140131	160-5485-2	Protactinium 234	2/13/2014	0.975	Yes	Y	U		U	1.14	1.14	pci/g
LT-R-002-5-10-20140131	160-5485-2	PROTACTINIUM 231	2/13/2014	-0.221	Yes	Y	U		U	0.245	0.245	pci/g
LT-R-002-5-10-20140131	160-5485-2	POTASSIUM-40	2/13/2014	6.73	Yes	Y				0.0835	0.0835	pci/g
LT-R-002-5-10-20140131	160-5485-2	THORIUM-234	2/13/2014	0.503	Yes	Y				0.189	0.189	pci/g
LT-R-002-5-10-20140131	160-5485-2	URANIUM-235	2/13/2014	0.0564	Yes	Y				0.0389	0.0389	pci/g
LT-R-002-5-10-20140131	160-5485-2	ACTINIUM 228	2/13/2014	0.599	Yes	Y				0.0241	0.0241	pci/g
LT-R-002-5-10-20140131	160-5485-2	BISMUTH-212	2/13/2014	0.712	Yes	Y				0.0962	0.0962	pci/g
LT-R-002-5-10-20140131	160-5485-2	BISMUTH-214	2/13/2014	0.356	Yes	Y				0.0167	0.0167	pci/g
LT-R-002-5-10-20140131	160-5485-2	LEAD-210	2/13/2014	0.417	Yes	Y				0.155	0.155	pci/g
LT-R-002-5-10-20140131	160-5485-2	LEAD-212	2/13/2014	0.622	Yes	Y				0.0134	0.0134	pci/g
LT-R-002-5-10-20140131	160-5485-2	LEAD-214	2/13/2014	0.41	Yes	Y				0.0138	0.0138	pci/g
LT-R-002-5-10-20140131	160-5485-2	THALLIUM-208	2/13/2014	0.208	Yes	Y				0.00947	0.00947	pci/g
LT-R-003-5-10-20140131	160-5485-3	LEAD-214	2/13/2014	0.343	Yes	Y				0.0112	0.0112	pci/g
LT-R-003-5-10-20140131	160-5485-3	URANIUM-235	2/13/2014	0.0276	Yes	Y	U		U	0.0286	0.0286	pci/g

SDG: 16054851

Analytical Method E901.1

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Report	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
LT-R-003-5-10-20140131	160-5485-3	URANIUM	2/13/2014	0.435	Yes	Y				0.145	0.145	pci/g
LT-R-003-5-10-20140131	160-5485-3	THORIUM-234	2/13/2014	0.435	Yes	Y				0.145	0.145	pci/g
LT-R-003-5-10-20140131	160-5485-3	THALLIUM-208	2/13/2014	0.163	Yes	Y				0.00609	0.00609	pci/g
LT-R-003-5-10-20140131	160-5485-3	RADIUM-228	2/13/2014	0.511	Yes	Y				0.0209	0.0209	pci/g
LT-R-003-5-10-20140131	160-5485-3	RADIUM-226	2/13/2014	0.868	Yes	Y				0.142	0.142	pci/g
LT-R-003-5-10-20140131	160-5485-3	Protactinium 234	2/13/2014	0.714	Yes	Y				0.688	0.688	pci/g
LT-R-003-5-10-20140131	160-5485-3	POTASSIUM-40	2/13/2014	7.8	Yes	Y				0.0632	0.0632	pci/g
LT-R-003-5-10-20140131	160-5485-3	ACTINIUM 228	2/13/2014	0.511	Yes	Y				0.0209	0.0209	pci/g
LT-R-003-5-10-20140131	160-5485-3	LEAD-212	2/13/2014	0.535	Yes	Y				0.00959	0.00959	pci/g
LT-R-003-5-10-20140131	160-5485-3	LEAD-210	2/13/2014	0.338	Yes	Y				0.122	0.122	pci/g
LT-R-003-5-10-20140131	160-5485-3	BISMUTH-214	2/13/2014	0.303	Yes	Y				0.0125	0.0125	pci/g
LT-R-003-5-10-20140131	160-5485-3	BISMUTH-212	2/13/2014	0.514	Yes	Y				0.0630	0.0630	pci/g
LT-R-003-5-10-20140131	160-5485-3	PROTACTINIUM 231	2/13/2014	0.25	Yes	Y				0.130	0.130	pci/g